AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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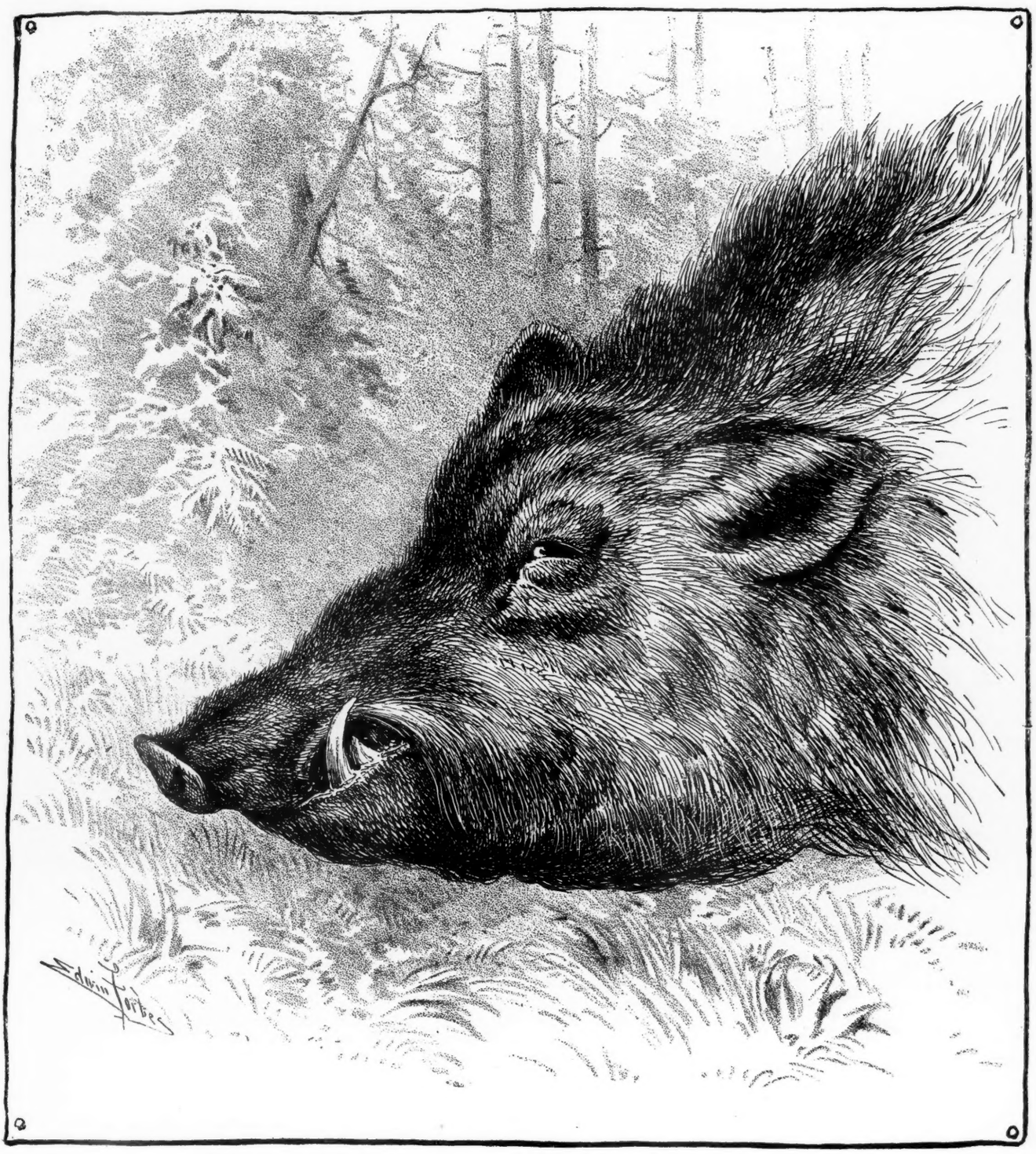

THE WILDBOAR IN HIS NATIVE HAUNTS. (*See Page* 541.)

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LET US RAISE MORE SHEEP.

JOSEPH HARRIS.

SHEEP, hogs and poultry may, to a certain extent, be regarded as the scavengers of the farm. They eat up and convert into a valuable product much food that would be otherwise wasted. But the supply of this cheap food is limited, and we may easily overstock our farms. We can often buy to advantage food, such as cottonseed and linseed cake, malt sprouts, dried grains, corn and bran to feed to sheep, provided we have a quantity of straw, hay and cornstalks that we wish to feed out on the farm and convert into meat, wool and manure. There is a growing demand for good mutton and lambs. In this country for a long time mutton was not a favorite meat. Beef and pork commanded a higher price. Now mutton is higher than beef, and judging from English experience this will continue to be the case. The demand for good lambs is phenomenal. It seems almost impossible to fully supply the demand. Lamb is not only intrinsically a good and nutritious food, but it is easier to keep in our hot climate than beef. A farmer who has plenty of ice and a refrigerator can kill a lamb for his own use. Let us raise more lambs. If the butchers do not want them at a fair price, we can keep them until they are a year or two years old and sell them for mutton. There is profit in doing so—sometimes more profit than in selling them as lambs.

In order to get a profit from keeping sheep and raising lambs it is not absolutely necessary that we should have the lambs excessively early. I have had lambs born at different times from the last of December to the last of May, but seldom get the main crop before March. I can generally get earlier lambs from grade Merino ewes than from the English mutton breeds. I will not go so far as to say that grade or common Merino ewes are better than ewes of the mutton breeds, but if I lived in a section where these common Merino sheep were plentiful, I should have full confidence that I could raise splendid lambs from them simply by selecting good, healthy, thrifty three- or four-year-old ewes, feeding them well and putting them with a well-bred mutton ram, or ram lamb.

There is not one of the above three points that can be neglected. The ewes must be healthy, strong, and thrifty. If they have much Merino blood in them they should be at least three years old. If they have more English blood in them they should be two or three years old. Our sheep are usually half-starved, and common Merino sheep will stand starvation and neglect better than the English breeds that are bred with reference to early maturity and rapid growth. For this reason it often happens that we can get healthier, and more thrifty common Merino ewes than common, neglected English breeds. Of course there is no profit to the breeder of such common Merino sheep that are kept for three or four years and then sold for $3 or $4 per head. But, if selected with judgment, the buyer may make money out of them. To do so, however, he must feed well and take good care of them.

A strong, vigorous ram lamb can be allowed to thirty or forty ewes, and a yearling to fifty or sixty. They should have good feed, and a quart of oats per day or a pound of oil cake or corn. A ram lamb will sometimes eat oats when he will not eat oil cake or corn. The ewes should have the best of pasture and, if early lambs are desired, a feed of grain or oil cake, say one pound each per day, will be amply repaid in the increased number, strength and size of the lambs. As soon as the ewes are served less grain may be fed, and if the pasture is good it may be omitted altogether. But remember that success in raising good lambs for the butcher depends largely on the liberal feeding of the ewes. "But what ram should we select?" I am inclined to think it will make very little difference to the actual value of the lambs what particular breed the ram is selected from. But it will make a great difference whether the ram is well-bred or not. By well-bred I do not mean mere purity of blood or pedigree. We cannot have too much of this, provided it is accompanied with good form, small bone, fine head and ears, short legs, good ham or "leg of mutton," good loin and a vigorous, healthy thrifty growth of firm flesh. In raising lambs for the butcher we do not care for wool. A pound of wool contains four or five times as much nitrogen as a pound of "lamb chops." Bakewell, the great Leicester breeder, probably did not know this fact, but his observation taught him to select sheep that matured early and grew rapidly rather than those which produced a great fleece of wool. When we are raising lambs to be killed for food at three or four months old, or chickens for broilers, wool and feathers are costly products. They run away with a good deal of food or, with what is still more important, a good deal of digestion and assimilating force. We want as little offal as possible. The less offal the greater will be the production of choice meat.

There is a popular notion that black-faced lambs are better than white-faced, and the butchers often leave the black skin on the heads to show their customers that they are of the fashionable breed. Of course the color of the head has nothing to do with the quality of the meat. A black-faced Cotswold is neither better nor worse than a white-faced one. It always makes me sad to see a young and hopeful farmer think he is going to get rich because he proposes to select some particular breed, and feed "well balanced rations." Old and experienced farmers know that the breed is not so important as a breeder, and the feed not so important as the feeder. In other words, success or failure will depend on the care, promptness, regularity, gentleness, persistence and good judgment of the breeder and feeder rather than on whether he selects South Downs, Shropshires or Cotswolds, or whether he feeds clover hay and oil cake, or clover hay and oats, or clover hay and corn. A good feeder who feeds clover hay and oil cake will beat a poor feeder who feeds clover hay and corn; and the good feeder who feeds clover hay and corn will beat the poor feeder who feeds clover hay and oil cake—no matter whether it is linseed cake or cottonseed cake, old process or new process. If we want good lambs, we must feed the ewes so that the lambs will be strong and vigorous, and so that the ewes will give plenty of good, rich milk. And then the lambs must be taught early to eat a little grain or oil cake. I have known men who could not get a lamb to eat, while another man with a little patience and good judgment would soon induce every lamb in the flock to run into the separate pen every time they saw him going to the trough with a pail of food. If the farmer who believes in well-balanced rations has such a man to feed his sheep, they will do well; if he has not and he does not know how to feed them himself, all the chemists in the world cannot tell him how to raise good lambs.

THE NEW DAIRY PROBLEM.

JOHN GOULD, OHIO.

The most important dairy topic that is now being discussed is the pooling of milk at the pastures, and the daily individual testing of the milk, basing values upon the butter-fat contents of the milk. Milk can directly have only two values to the factory man, the butter fats and the caseine. The sugar in the whey is incidental and is classed with the wastes. The less of it he retains in the butter or cheese the better he is suited. The caseine and the fats are the chief values. Is the man who sells milk by the fat-test plan, best known as the Babcock test, dealt fairly with? The idea has been that milk, large in quantity and low in fats might be "rich in caseine," hence the farmer should have such milk tested for both fat and cheese and be paid for accordingly.

This has caused a great amount of investigation among the experts, and the figures deduced do not bear out the assertion that normal milk has a greater per cent of caseine than fat; while, on the contrary, in the milk of certain cows the fats far exceed the caseine. The recent claim that a good cheese cow must first be a good butter-producing cow, while a butter cow may be less valuable as a cheese producer, is fully confirmed. The per cent of caseine in normal milk is practically below the fats, and if a cow giving sixty pounds of milk per day has two pounds of pure butter fats in it there will be one and three-fourths pound of pure caseine or cheese. No instance is yet recorded of a proportion of two per cent of fats and four per cent of caseine in a healthy cow's milk, and the fat test is supreme as yet in factory and creamery practice in division of the proceeds. The day is now at hand when the division of the butter and cheese among the patrons must be based upon the fat and caseine solids of the milk rather than the weight in pounds of milk, and rely upon the balance of errors to even the thing up. Prof. W. W. Cook, of Vermont, has done some most painstaking work in this line of investigation to determine whether the fats of milk are to all intents and purposes a correct base of calculation for factory work. He has compared forty-four hundred analyses of milk for that purpose, and has found that in Ayreshire, Shorthorn,

and Holstein cows the caseine is ninety per cent of the fat content of milk, while the Jerseys and Guernseys give milk in which the caseine is only seventy-five per cent of the fat.

In feeding cows to increase the solids it was found that the natural harmony of the solids was not thrown greatly out of balance. The increase of fats was followed by an increase of caseine, but not so fast; so that in cows that gave 3.07 per cent of fats the caseine was nearly equal to 3.92 per cent caseine, but in 6.00 per cent milk the caseine had only reached the 4.20 per cent line, thus demonstrating that whether the milk was rich or poor the caseine kept very close to the point of one-fourth of the total solids. If a man should doubt that the cheese element in the milk he offered was credited properly the test would be to sample the milk for butter fats, dry down one ounce of milk to its water-free solids, weigh them, and one-fourth would be caseine, a calculation which is quickly made. With average dairy cows, Ayrshires, Holsteins, and Shorthorns included, the fat test is the nearest practical method yet devised for the equitable payment for milk values at the factory or creamery.

The injustice of the present pooling plan of selling milk is apparent to all; but the vast army of farmers who have dairies that only give three per cent fats in milk, who cry that "milk-testing is a humbug, and cheats us out of our overplus caseine," have held the testing plan in check, but now, since it is fully proven that there is no milk "rich in caseine," that butter fat in excess is the element that gives cheese its superior market value over "skims," the test will be now more popular, and is destined to become the buying plan of milk. The idea that samples of each milking must be tested stood in the way as entailing so much work, but it is now found that the samples may be taken twice per day, placed in a small fruit jar for a week, a little diluted potash added to kill the microbes, and a single sample at the end of the week tested, gives the same answer that the fourteen separate tests averaged, saves a vast amount of work, and removes the objection.

What shall be done with milk above four per cent butter fats? It should be made into butter, as a rule, and the skimmilk fed, as such rich milk is also rich in sugar—over five per cent—and is most valuable fed as sweet skimmilk to calves or pigs. If for cheese making, such milk should be secured separately, enough cream removed to bring it down to the four per cent line, when it may be added to the other four per cent milk for cheese-making. Fats over four per cent in milk would add nothing to the market value of the cheese even if this excess of fat above four per cent could be retained in the curds during the process of manufacture. This is a most difficult thing to do, as caseine has little power to amalgamate with more than its own weight of fats. Then the market pays nothing for an excess of fats in cheese above equal proportions of fat and caseine. A cheese made of five per cent fat milk sells for no more in the market than another made from four per cent milk. The pound of twenty-five cent butter saved would be additional profit.

BLACK RUST OF COTTON.

DR. B. D. HALSTED.

The cotton plant, one of the prominent crops of our Southern States, is not exempt from the attacks of injurious fungi. Of these the so-called black rust in many localities has done much damage to the cotton crop. The trouble, in fact, has been of such importance that it was a subject of special study at the Alabama Experiment Station, and from a bulletin just at hand the following facts are drawn. When a plant is badly diseased half or more of its leaves have fallen off, while the remainder are curled, blackened, and worthless. What is known as "red rust" is probably a reddening of the foliage, due to lack of sufficient nourishment for the plant. It has been found that several fungi contribute to the production of the black rust. There is, for example, a species of anthracnose, known to science as *Colletotrichum gossypii*, that attacks healthy plants, and may be propagated artificially by inoculations. There is the Cotton Leaf Blight (*Cercospora gossypina*), which is characterized by light brown patches of the leaf, sometimes resembling blisters. Upon the infested areas the spores of the fungus are borne upon the tips of projecting threads, and are scattered from there to new places, and become new starting points of the disease. A third species of fungus found associated with the black rust is the *Macrosporium rugricantium*, newly discovered and named by Prof. Atkinson, author of the bulletin. This fungus, as a rule, follows closely upon the attack of the *Cercospora* or *Colletotrichum*, and is in turn followed by a fourth species of fungus, of the genus *Alternaria*. It seems from this that the cotton anthracnose (*Colletotrichum*) and Leaf Blight (*Cercospora*) are the forerunners of the other forms, and are the true parasites preparing the way for less aggressive species of fungi.

There has been much speculation in agricultural papers regarding the cause of the cotton rust. Some have held that it was due to conditions of soil. This is true of the red rust before mentioned. Another theory was that the black rust is due to atmospheric conditions, but it is due to these only so far as they favor the growth of the fungi causing the disease. Continuous wet weather with high temperature while not conducive to the growth of cotton is favorable to the production of the black rust. It is doubtless true that if the soil and the atmosphere were both always the most favorable for cotton there would be less of the rust, from the well-established fact of the resistant power possessed by perfectly healthy plants (and animals as well) over those weakened by insufficient nutrition or other causes. The experiments with the cotton rust teach the importance of having the conditions for the cotton plant of the very best.

SOME VALUABLE SOUTHERN GRASSES.

HENRY STEWART, NORTH CAROLINA.

That grass is the basis of good agriculture is true everywhere, yet it is not so very long since that the Southern cotton planter dreaded grass as his worst enemy. It is a fact that a Georgia planter applied to a court for an injunction to prevent his next neighbor from sowing grass on his own land. It was not more than ten years after that that a person known to me purchased a "grass infested" farm in the same State for a small sum. Acting under my advice he procured some hay-making machinery, and the first year made more money from the hay than the whole cost of the farm, machinery and expenses amounted to. I have cut $40 worth of hay in one year from land that cost me $10 per acre, and on one field, yet in grass and clover, I have now made five such crops consecutively. But I wish at this time to refer to some of the "native" grasses of the South which I have become acquainted with. They spring up everywhere, and no doubt are a bad pest to the cotton grower when handled unskillfully, but when turned to the uses for which they grow they are worth more than any cotton crop that can be grown.

Bermuda grass (*Cynodon dactylon*). This species is perennial and grows from running rootstocks, which may be used for planting. It is a very leafy grass and has a flower stem which carries three or more flat, spreading spikes which spring from the top of the stem. It is one of the most valuable pasture grasses, and on rich soil I have seen it a thick tangled mass over two feet high. When manured occasionally this grass is the best kind for a permanent pasture or for hay. This grass mixed with the next one is fast covering one of my timothy and clover fields, which is a source of gratification to me.

Mexican Drop-seed grass (*Muhlenbergia Mexicana*) is similar in growth to the foregoing, except that its flower stems start from the axils of the long, abundant leaves, and carry panicles much like those of red top, but quite contracted and flattened. On one plant I have counted more than twelve of these branching stems, each with a panicle or two or three of them. The leaves are long and narrow, and the growth is exceedingly dense and heavy. I have cut it green for cows and horses, which eat it greedily, and it makes excellent hay. The roots are thick, scaly, and much like a hen's claw, and run underground and spread rapidly. Any fragment of a root will make a plant the same year. It is so permanent that in spite of all efforts it has taken possession of a rich piece of garden ground, a lawn and an orchard, and is fast covering the fields. As it has good feeding quality, especially for dairy cows, this vigorous growth adds value to it, unquestionably. This, and the Bermuda grass, flourish almost everywhere in the South, and the former I have had growing in New Jersey, where it comes quite late in the season with the crab grass.

Crab grass (*Panicum sanguinale*). This grass, also known as Finger grass, and which the cotton planter hates so much, is known by its five fingered spreading panicle which is purplish in color. It grows abundantly where the land is stocked with it in rich bottoms. I have cut it, for feeding green, four feet high. As it is an annual, it would soon be exterminated unless cut when the seeds are ripe, so that the ground will remain stocked. It is most valuable for feeding green, but makes very good hay. On good land it will yield fully three tons of hay to the acre, and is well worth the saving of the seed for sowing, as millet is sown. Barnyard grass

(*Panicum crus-galli*), is another annual plant, and very common in moist, rich land, where it grows luxuriantly. It has thick, coarse spikes with large, long leaves and juicy stems, and is eaten readily by cattle and horses. It makes as good hay as millet.

A very valuable indigenous grass common in the mountain and Piedmont region, is *Agrostis elata*. This is related to the common red top (*A. vulgaris*), but is a more luxuriant grass, growing three to four feet high and springing up without seeding on newly-cleared land. It makes a light hay but excellent pasture, and while it is of value in places it is inferior to the perennial kinds mentioned which are more valuable on account of their permanence.

For many years I have urged the growth of grasses in the South. On closer acquaintance with this region I am more and more convinced that grass and its products will be of more value, some time, than all other Southern products. It will make the beef, pork, mutton, wool, mules and horses which many Southern farmers purchase at a large cost. It will enrich the soil and make all the old fields productive. It will prevent the injurious waste of land by washing, and will retain upon the soil the vast quantity of fertilizing matter which now goes down to the ocean in the numerous great rivers which carry a milky stream, colored by the riches of the uplands. And the South possesses in the perennial species named above, not to mention the prevalent blue grass, a source of wealth which may well be envied by farmers in the North.

GERMINATING NUTS.

The only reason why many persons fail to make such nuts as pecans, hickory, English walnuts, and chestnuts germinate when planted is that they allow them to get thoroughly dried before they are placed in the ground. For pecans, shellbark-hickory, butternuts, filberts, and other hard-shell kinds there is no better place to store them during winter than in heaps of sand piled up on some shady spot in the open ground. First place a layer of the nuts, then a layer of sand, then a layer of nuts, and proceed in this way until your stock of nuts is exhausted, and cover the heap with six inches of good soil or sods, and leave all undisturbed until spring, then take out the nuts and plant in drills. If there is danger of mice and squirrels carrying away the nuts, place them in well-drained boxes, covering with wire netting. Chestnuts may be stored in the same way, but the sand should be clean and the boxes set where the water from melting snows will quickly drain off. Fresh imported English walnuts buried in the fall or any time in the early winter will usually germinate quite freely. Imported filberts are sometimes gathered before quite mature, and for this reason fail to grow, but if the kernels are plump when obtained there is no danger of failure if kept cool and moist during the winter.

AN OLD PEST IN A NEW ROLE.

A. S. FULLER.

I am in receipt of an old and long-known insect pest which appears to be playing a new role in the great drama of insect devastation. Mr. L. D. Hubbell, of Fairfield Co., Conn., sent to the AMERICAN AGRICULTURIST two half-grown plums with a small beetle he found eating off the hard green rind. This beetle, upon examination in its crushed and dried condition in which it was received, proved to be our well-known Northern Epilachna (*Epilachna borealis*). It is an oval-shaped beetle about a quarter of an inch long, of yellow color and with six round black spots on each elytron or wing cover. The Epilachnas, of which we have three or four native species, are classed by entomologists with the Lady-beetles or Lady-birds (*Coccinellidæ*), a very large and respectable family of small beetles which in the main live on plant lice and the larvæ of various species of small insects of other orders, but the Epilachnas are the black sheep in the flock, for they are vegetable feeders, and this Northern species now under consideration has often been detected in peeling watermelon, and I have myself found more than a hundred at work on one large melon, merely eating off the outside thin green rind and, of course, not only checking the growth of the melon but causing its rapid decay. But plum-peeling is a new vocation for this insect—at least new to me—and if its taste will allow it to go from melons to green plums we cannot attempt to place a limit upon its depredations in our orchards and gardens. It has also been known to attack squashes and pumpkins, but these are so nearly related to melons that it might have been expected; but from melons to stone fruits is a long jump in the way of food for an insect, and this "fruit peeler" will hereafter bear close watching.

As most persons dislike to use scientific names when they can be avoided, I propose "Fruit-peeler" as a popular or English name for this Northern Epilachna, as this will readily distinguish it from the other members of the great family of useful insects generally and collectively known as Lady-birds or Lady-beetles. This fruit-peeler hybernates in its perfect or winged stage, and may often be found in large numbers huddled together under old fence-rails, bark, brush, and other rubbish about the farm and garden. All that are found in such positions during the fall and winter months, or at other times, should be destroyed. Spraying plums or melons with Paris green or London purple will quickly kill them.

SAVING SEEDS.

A. L. CHARLES, NEW YORK.

The average farmer and gardener had better pay twice what his seeds now cost him than to save his own, and yet with proper care a better article than can be bought may be secured, and this at little cost. Every man wants the best, and that is the best which suits him the best. There is a great diversity of taste; no two agree as to which is the best, as the same seed grown under different circumstances will produce different results. Some prefer one form, color, or flavor; another quite the reverse. This is an individual matter, and cannot be settled by argument. We all have our preferences as to species or types, whether in vegetable, fruit, or flower; and we want the best of a chosen type. This can only be had by selection of the plant that produces just such flowers or vegetables as we prefer, and save the seeds from such for future use. It requires great care and no little skill to make selections valuable.

After a choice of plants has been made the first flowers should not be allowed to seed, as they are never so perfect as those that come later; so that it is difficult to establish the type. If the second are all that is desired, if they are improvements over those of previous years, do not let others on the same plant ripen seed, but carefully remove all buds except the one saved, and let that have all the vigor of the plant until the seeds are ripe. Then if the plant produces more flowers, it is well enough, but the contents of one capsule will be sufficient to keep up the stock, and the seeds will be the best that can be produced. The same is true with vegetables. Do not save the first squash, cucumber, or tomato that forms; the plant does not produce its best fruit early. Cut it away, and if the second is satisfactory let it have the full strength of the plant. This is the manner in which types are improved and new varieties produced. Whenever flowers or vegetables show the slightest improvement or change it is a sure indication of a new, perhaps a distinct, variety. From this save the best specimen of vegetable or flower, and do not allow another to ripen seed. This means improvement, and adds to the pleasures and profits of gardening.

BOLTS FOB FARM MACHINERY.

J. N. MUNCEY, IOWA.

A farmer who has two hundred dollars and upward invested in farm machinery can well afford to buy from three to five dollars worth of bolts of the different sizes such as he wants when one breaks or a nut loses off. In taking the machine apart for repairs if the thread of a bolt is battered and spoiled, or the nut is rusted on and the head of the bolt turns in the wood, the quickest way is to cut the bolt off and replace it with a new one. When very busy in haying or at other work, and several men are waiting on some machine, it does not pay to spend a half hour or even fifteen minutes in trying to get a nut off without damaging the thread. Cut it off, throw it away, put in a new one, and start up. A very good method is to have a little box containing a few of the more important sizes attached to the machine in use. Five dollars' worth may include the following sizes: Three-sixteenths-, one-fourth-, three-eighths- and one-half-inch, not taking anything longer than about ten inches, and buying four of each kind. The first three sizes mentioned are most frequently used in machinery, and one half-inch bolt of each length would do fairly well for the average farmer.

Bermuda Grass. — This is one of the most common grasses throughout the Southern States, and in rich soil gives a fine cut of hay. Its greatest value, however, is found in its being the best of pasture grasses. It grows well on dry soil, and may be seen creeping over the oyster-shell roadways, where nothing else can grow. In cultivated ground it is eradicated with great difficulty, and in such places it ranks as a troublesome weed. At the North it is working its way into some places, and when once introduced it is to be dreaded. We do not need any such a low, persistent grass for either pasture or meadow at the North, and can only regard it as an enemy to the farmer and gardener.

THE WILDBOAR AND THE BOARHOUND.

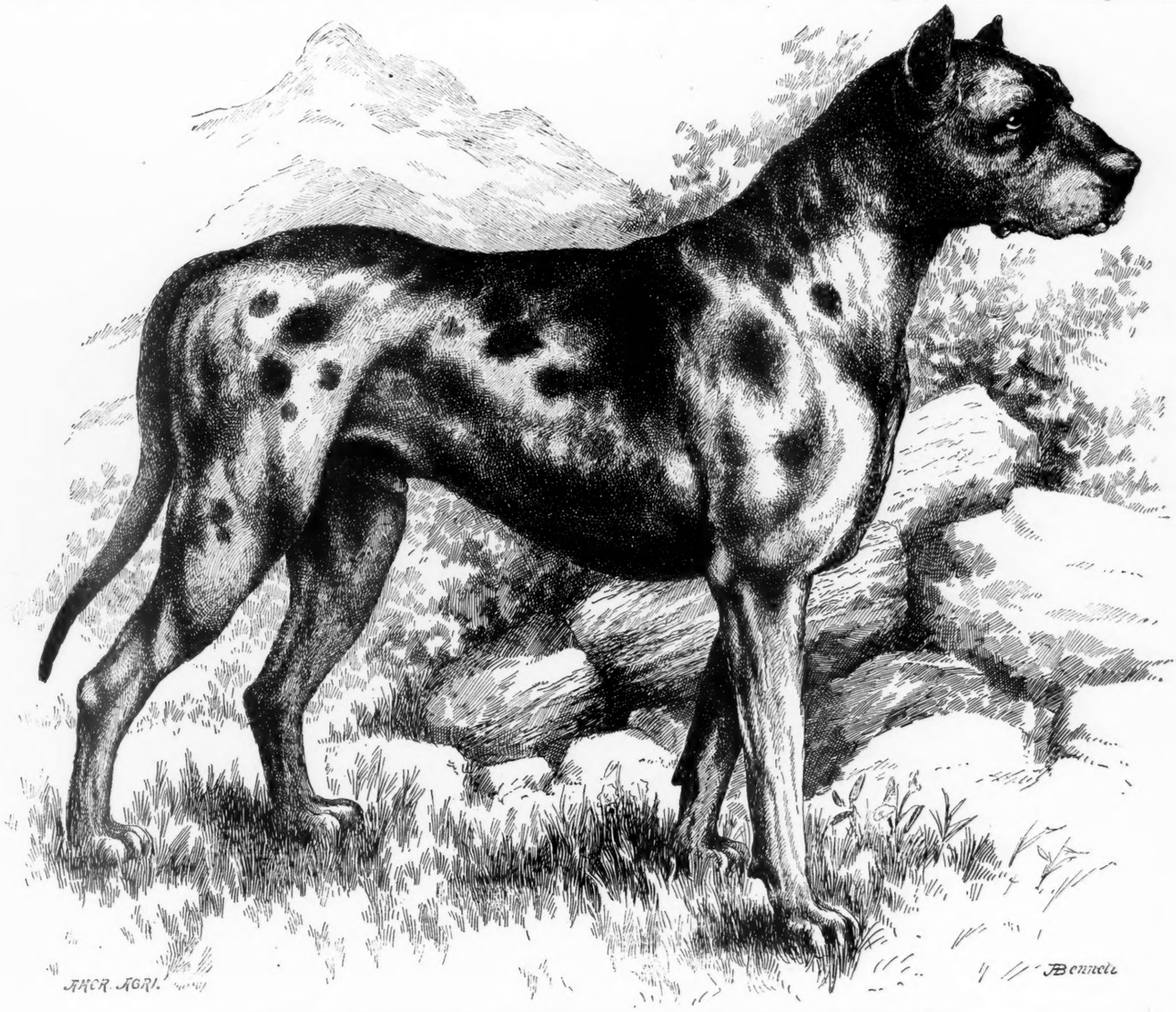
G. A. WOOLSON, VERMONT.

From a scientific standpoint the history of the boarhound is most interesting. This dog does not belong to a natural race, but is practically the result of systematic crossing, a successful blending of Nature's laws to meet the exigencies of the occasion, and this occasion was the superabundance of wildboars in German forests.

These creatures, although the progenitors of our domestic swine, differ in many points; they are never fat; the neck and forequarters are marvelously developed and possess great strength; the snout is long and flexible, and the sense of touch and smell extremely delicate; they are covered with stiff bristles, and the heavy crest along the back is, in itself, no mean weapon; but this is not the feature which makes the wildboar a dangerous foe for man and beast; each jaw is furnished with two long, sharp tusks pointing upward, which are indeed formidable weapons. The wildboar is fierce and active; a swift runner, and a hard fighter; dealing deathblows to man and beast by swift, upward strokes of his powerful tusks.

Hunters were at a disadvantage because no race of dogs existed which possessed the requisite qualities for assisting in the subjugation of this savage beast. Hence the wildboar flourished in the Black Forests until the idea of breeding a dog especially for this purpose was conceived. In order to accomplish this the mingling of several races of domestic dogs became necessary. The origin and descent of the boarhound is not definitely known, but the breed is of great antiquity. A combination of the mastiff and greyhound undoubtedly prevails in the makeup of the breed as it is known to-day. Another breed takes some part in the mixture. The admixture of the mastiff gives the required muscular power and dimension of body; while that of the greyhound insures speed.

As might be expected from animals bred in this manner, the boarhound is developed in form, color, habits, and disposition according to the element which may chance to predominate in the individual. The dog is attractive because of its immense size, often measuring from thirty to thirty-two inches at the shoulder. Its color is rarely black and white, more often brindled patches appear on a dull ground, and sometimes the tawny coat resembles that of the mastiff. The eyes are small and deeply set, yet are not lacking in expression. The erect carriage of the head—seen in the best specimens—gives the creature as much of the pert style as it can well carry without loss of the dignity we look for in a dog of such noble build; nevertheless the caprice of dog-fanciers has added to the naturally presuming air of the dog by closely cropping its ears; a practice which robs the dog of its one real beauty, and spoils the symmetry of its massive head. The loving disposition of the hound is often traceable, likewise its seeming cowardice. The pups appear stupid but,—like great lights among men,—come to their brains later in life than ordinary dogs; in fact, they are much more teachable at two and a half or three years of age than at an earlier period, showing that it is not always "hard teaching old dogs new tricks." Where the mastiff is the dominant element they make excellent dogs for family use, as the mastiff is *par excellence* the watchdog and guardian of the house.



A NOBLE TYPE OF A NOBLE RACE—THE GREAT DANE.

Good training is as essential as good blood. Too much stress cannot be laid upon this point, for, whether the subject be mastiff or boarhound, thorough discipline is absolutely necessary. No

amateur should attempt the training of either. The disposition of the boarhound is especially complex, and if the laws of heredity are to be depended upon there is a chance for as formidable an animal as one cares to meet in the ordinary walks of life. The aggressive combativeness of the mastiff is generally understood; but it is not so well known that a treacherous element exists in greyhound blood. Although the greyhound, taken singly, is gentle and not overbrave, greyhounds *en masse* are ferocious and cruel; therefore, the combination is not always desirable for domestic purposes, which surely was not the use for which the dog was originally bred.

The bravest man, if going unarmed, may well be pardoned if his hair rises and his knees tremble if beset by an imported boarhound that has not learned to distinguish friend from foe. All animals, however, are as liable to inherit the virtues as the vices of their ancestors, and some of the best disposed dogs I have ever known are among boarhounds. One of them is the devoted attendant of a country doctor; very stately he looks carrying the doctor's medicine-bag to and from the carriage or following the doctor's bicycle with the aforesaid bag in his mouth. Although making good time, apparently not a muscle of his head or neck moves, for Pedro understands that mixing is not his part of the business.

The dog is imported and bred to a limited extent in this country. Wildboars no longer range at will, but are preserved in the State forests of France and Germany. Hence there is little legitimate use for the dog, which is employed chiefly in Denmark and Norway for hunting a much nobler animal, the elk. There is, however, a possibility that the dog may be again called to follow its natural vocation in private parks if the desire for savage game increases among sportsmen. Lord Sackville is said to have stocked his great park in Kent, England, with wildboars for the purpose of indulging friends in a boar hunt of the true mediæval order. Even in our own country the uncanny beast has found its way, and is noted among the importations in Corbin Park.

The boar is usually hunted on horseback, with dogs and boarspear, it being considered unsportsmanlike to use bullets. To train the dogs rightly for the work is a matter of difficulty, for a mistake is always fatal. Great tact is necessary on the part of the hound in getting into position so as to make his onsets in a manner not to expose himself to foam-flecked tusk, and yet act in concert with his companions and engage the attention of the boar while the hunter delivers the deathblow. It is evident from this that hunting the wildboar is fraught with considerable peril to the hunter and his horse as well as to the dogs, for when a ferocious boar becomes madly excited or is brought to bay he charges with impetuous speed and almost unerring aim, frequently ripping open one or more of his adversaries with his gleaming, sharp-edged tusks. The skillful hunter endeavors to avert such a disaster by a well-aimed spear thrust.

[Our engraving herewith presents an excellent portrait of a typical pure-bred boarhound, and in our frontispiece is given a side view of a wildboar's head.]

SAVING SEED POTATOES.

C. L. ALLEN, LONG ISLAND.

There is a principle in seed saving that applies to potatoes as well as to other plants. This principle is selection, and selection means choice in all that relates to a crop, no matter what it may be. It is essential in its relation to earliness, quality, and productiveness. It is a well-known fact that any vegetable grown in a given locality will, if proper attention is paid to the saving of seed, and, by selecting the best plants for the purpose, gradually improve in all points that go to make up a choice variety. In a few years a distinct type will be secured that will for a long time remain constant, even when grown under other conditions. The proper time to commence this important work is not in the early spring, but before the crop is dug. It is the best way to go over the field, select the hills with the most vigorous vines, especially those that are growing singly, the shorter and more stocky the better. Dig these before the main crop is disturbed, and save such only as produce the most potatoes to a plant, and such as are the most uniform in size and shape, not those that yield the largest tubers, but those that give the greatest number of good, salable potatoes, and the least small or poor ones. Vitality is an essential element in all plants, as upon it depends productiveness. When a hill is opened, if there is a single potato that is not perfect, discard the whole. Each tuber should be carefully examined as to form, color, and shape, and, what is more important still, see that it has a clear, thick skin.

This work, although it may be tedious, is profitable; it will take perhaps a day for a farmer to secure sufficient for his next year's planting, but in return for his labor he will get better seed than he can buy for twice as much as his crop sells for. If followed up for a few years in any given locality it will secure to the grower a stock that will be far more productive than any grown under other conditions and in different localities. This plan has been followed successfully by some of the best farmers in our country. When the early Ohio potato was first introduced, one of the most successful farmers on Long Island, N. Y., convinced of the great value of this variety, commenced the work of systematic selection. The result was a variety or type of far greater productiveness, of a more globular shape, and in every way a much superior potato. Not only that, but he selected with a view to earliness with surprising results. What this man has done others can and ought to do, and there is no better time to commence than the present.

HOMEMADE CHEESE IN HOT WEATHER.

JAMES L. COWEN, MONTANA.

To make cheese in hot weather the milk should stand until it is so sour that the whey separates naturally from the curd. The whey should then be drawn off and be used in equal parts with the milk that is to be curdled. This proportion of whey will curdle the milk instantly, thus retaining all the cream in the curd. Milk, warm from the cow, may be strained into the sour whey, care being taken to stir the mixture thoroughly and, then, if kept warm from twelve to twenty-four hours, the curd will float to the surface. This curd may be dipped off into a pan tilted enough to allow the whey to drain, and after salt has been thoroughly stirred in the curd should be merely warmed, which will cause it to set and facilitate the separation of what whey yet remains. After the curd is set it should be cooled and cut into segments. These segments are then covered with netting, to keep off the flies, and placed in the sun, being occasionally turned, to cure. Should the weather be very hot they need not be exposed in this manner. When cured to suit the taste this cheese must be soon eaten, for no cheese will keep long from which the whey has not been thoroughly extracted, since the whey rapidly decays. A sufficient quantity of very sour whey should be saved to curdle the next batch of milk that is needed.

By this simple method cheese has been made in hot weather which could scarcely be distinguished from the best pressed cheese. In cool weather the results are not so favorable as to flavor. The curd when salted and pressed into thin, slender bags, and hung up to cure, might make as good cheese, perhaps, as when dried in segments, and the bags could be twisted to squeeze out the superfluous whey more thoroughly, or they might be placed under a weight. Those who follow these simple directions carefully may feel sure to have homemade cheese to their liking.

TRIALS OF FARM APPLIANCES.

F K. MORELAND, NEW YORK.

A field of investigation which might profitably occupy considerable attention at our experiment stations would be the trials of farm implements for the purpose of estimating the advantage and value of the different kinds offered in market. It is a well-known fact that certain implements are much more heavy for the team than others, and in consequence thereof are called "horse-killers." But there should be a more definite understanding as to the application of such a term. In any given implement, the spring-tooth harrow or an improved pulverizer, for example, are much more difficult to draw than the old-fashioned harrow. On the other hand the pulverizer or spring-tooth harrow does its work much better than the old-fashioned implement. There may not be the same advantage in a mower or reaper that draws harder than some other mower or reaper, and in this case the machine of lightest draft may be the most advantageous and the cheapest for the farmer to purchase. With regard to plows, the question of draft may decide the style of plow to purchase. In all cases, however, the draft of a farm implement is a very material consideration in deciding which is the most desirable. A series of such experiments while perhaps not conclusive would be of great interest to a majority of farmers. At the experiment station the trials can be made under a variety of conditions which would be approximately similar to the general conditions of farm works and would aid the farmer materially in selecting farm machinery.

RED POLLED CATTLE.

GEO. A. MARTIN.

The Red Polls of to-day may be called a comparatively new breed, though the races from which they are the direct descendants have a distinct history running back nearly two centuries. Records of the early part of the eighteenth century show that there were in the eastern counties of England polled cattle, which at that period were known to be an ancient race whose origin was lost in the mist of ages. There were two distinct types—the Norfolk and the Suffolk. John Kirby writing in 1732 describes the Suffolk as small, very few when fattened weighing more than 700 pounds. They were milkers of great staying power, giving milk rich in butter fats. The Norfolks of that period were smoother and more compact in form, fattening easily and making beef of high quality. The modern red polled cattle have come from judicious interfusion of the two ancient races and careful selection. They inherit the bright red color and beef-making qualities of the old Norfolks combined with the milking gifts of the Suffolks. For many years the improved breed was known as the "Norfolk and Suffolk Red Polls," that name having been bestowed by the Royal Agricultural Society in 1863. This name has since been shortened to the present sensible designation. Notable triumphs were won by its representatives in many English shows. At the Battersea Show in 1862 the exhibit of these cattle attracted much admiration; and at Worcester, two years later, they made a clean sweep of the prizes for miscellaneous classes. This has been repeated at several subsequent shows, notably at Cardiff and Hull in 1872 and 1873. In these shows the judges laid more stress upon their beef-producing qualities than upon their milking characteristics. In 1874 the "Norfolk and Suffolk Red-Polled Herd Book" was established at Norwich, England, under the able editorship of Mr. Henry F. Euren, who continues to act as editor of the publication, and secretary of the Red-Polled Society of Great Britain and Ireland, by whose authority it is issued.

In the United States the Red Polls have long been known to a limited extent, though their wide distribution and general popularity are comparatively recent. Mr. A. W. Cheever, the noted agricultural writer, maintained a dairy herd of Red Polls for many years, and gives valuable testimony to their merits. But the first considerable importations were made by the late G. F. Taber, of Patterson, N. Y., within a little more than a decade. The breed won much popularity, and subsequent importations followed rapidly. They have now obtained a permanent foothold not only in the Eastern and Central States but throughout the West and Southwest. In 1883 the American Red Polled Cattle Club was formed, with Gen. L. F. Ross, of Iowa, as President, a position he continues to fill with marked ability. Unfortunately the club neglected to effect a legal incorporation and copyright its herd-book; complications arose from this, and it was only after a struggle that the club succeeded in securing legal rights to which it should have been entitled from the first.

The Red Polls it may be are, about as near as any cattle can be, a "general-purpose" breed. The cows give a generous yield of fairly rich milk; the steers and dry cows fatten easily, making heavy carcasses of excellent beef. They are polled, without the agonizing dehorning operation to which so many animals born with horns are subjected, and in general may be regarded as peculiarly a farmer's breed.

Fig. 1. THE RED POLLED BULL PANDO 358 (254.)

Several highly successful trials have been made recently of crossing red-polled bulls upon Jersey and Ayrshire cows. The result has generally been hornless progeny having to a large extent the dairy characteristics of the dam. Several fine dairy herds have been built up in this manner, having the appearance of Polled Jerseys or Polled Ayrshires. The Red Polls have been bred pure so many generations that the polled characteristic is permanently fixed, and is transmitted with great certainty to their cross-bred descendants. As already intimated the Red Polls are bred for both beef and milk. The judges at the Battersea Show of 1862 reported officially of the specimens exhibited that they possessed "great merit, size and symmetry, with good flesh and constitution, and plenty of lean to the fat—all qualifications for making as much good beef at the least possible cost from a given quantity of food as any breed in the yard." To this nothing need be added, save that, after thirty years of skillful breeding they have lost nothing of the qualities thus succinctly set forth. As to the quantities and quality of the milk produced by cows of this breed there has been an unfortunate paucity of such definite information as can be obtained only by carefully-kept milk records. The lack is to some extent supplied by a record kept by Mr. Garrett Taylor, of Whitlingham Farm, Norwich, England. He has recently given to

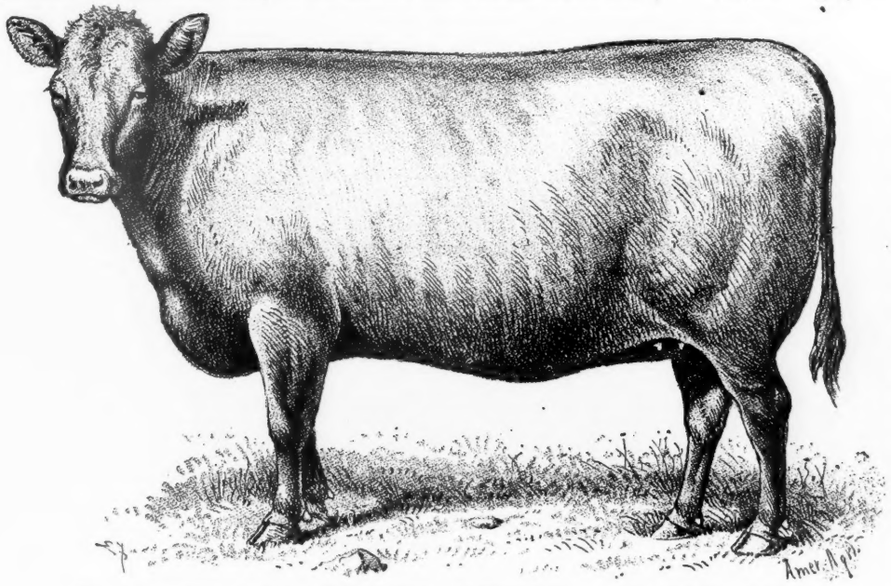


Fig. 2. THE RED POLLED HEIFER PARAGON 5827.

the public his record of one hundred and sixteen cows, extending through ten years, from 1879 to 1890. From this we extract a few typical records, selecting such as cover the greater part of a year's product:

Name of Cow.	*Age Y'rs*	*Record From*	*Calf.*	*Yield. Lbs.*
Dot	4	Feb. 25, 1887 to Jan. 19, 1888	2d	9,343
Carlista	3	Nov. 11, 1887 to Aug. 6, 1888	1st	8,630½
Coralie	2	Nov. 24, 1887 to Oct. 4, 1888	1st	5,470¾
Cinnamon	7	March 8, 1888 to Feb. 28, 1889	3d	6,329
Sybil 6th	6	Aug. 9, 1888 to June 27, 1889	4th	7,452
Elizabeth	7	May 24, 1888 to May 9, 1889	5th	6,702
Eglantine	3	Feb. 14, 1888 to Jan. 24, 1889	2d	5,681
Poll	8	July 11, 1888 to May 9, 1889	6th	7,215½
Poll	9	May 23, 1889 to March 9, 1890	7th	8,007½
Red Daisy	5	Feb. 24, 1887 to Feb. 16, 1888	3d	9,555
Justice	4	Feb. 27, 1889 to Jan. 3, 1890	1st	5,021½
Patsie	7	May 3, 1888 to March 21, 1889	5th	7,420½
Fillpail	9	March 4, 1889 to March 3, 1890	7th	11,077
Di	5	March 15, 1888 to Feb. 14, 1889	2d	8,427
Prudish	5	May 2, 1887 to May 1, 1888	3d	7,524
Prudish	6	May 17, 1888 to April 18, 1889	4th	6,422
Prudish	7	May 30, 1889 to May 30, 1890	5th	7,662½
Coronet	4	April 23, 1888 to April 4, 1889	2d	9,103
Coronet	5	May 4, 1889 to May 25, 1890	3d	12,253

The entire record, some parts of which cover the respective products of only a few weeks or months, indicates an annual yield of between seven thousand and eight thousand pounds of milk per cow. Chemical analyses by Dr. Voelcker and Mr. F. J. Lloyd showed the milk of the various cows to contain from 2.90 to 4.55 per cent of pure butter fat. The yield is not phenomenal in amount compared with many Holstein-Friesian records, nor is the milk as rich in butter-fat as that of Jerseys or Guernseys. But the yield is a good, fair one, far greater than the average of even good, "native" cows, and the quality is fully equal to that of other pure-bred cattle except the special butter breeds of the Channel Islands.

The only American milk record of this breed at hand is a partial one kept by Mr. V. T. Hills, Delaware Co., Ohio, and from that the following is an extract:

Name of Cow.	*Record From*	*Yield. Lbs.*
Mayflower	Aug. 1, 1890 to June 15, 1891	8,840½
Milton Rose	May 15, 1891 to June 15, 1891	1,136½

Figure 1 is a portrait of the bull Pando 358 (254), owned by Mr. V. T. Hills. The animal in 1889 took the champion prize at the Norfolk and Suffolk Show, England, and both the Queen's gold medal and the Red Polled Society's champion prize at the Royal Show, Windsor. At five years old he weighed 2,480 pounds. Figure 2 shows the heifer, Paragon, 5,827, at eight months.

HARVESTING CLOVER SEED.

A heavy crop of clover seed can be cut with an ordinary mowing machine and raked up with a steel rake. The windrows will need to be repeatedly turned and sometimes, if the crop is green, shaken out. When dry run the steel rake along the windrows and put the clover into carefully-made, good-sized cocks that will shed rain. Let the clover sweat in the cocks, if it will, and when dry draw

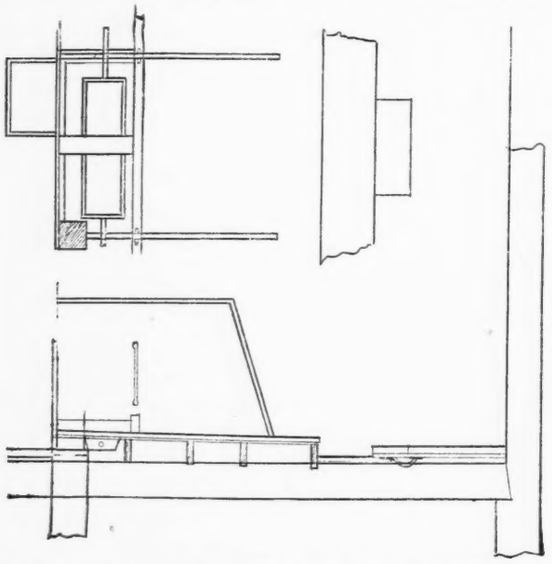


FIG. 4. SECTION OF STALLS, AND WATERING TROUGH.

into the barn. Before we had such good threshing machines and clover hullers it was deemed desirable to expose the crop as much as possible to the weather, letting it get wet and dry several times until it was nearly half-rotted. After such exposure, when dry and kept until cold weather, it threshed easier. This is not now necessary.

A light crop of clover seed, one that is short and thin on the

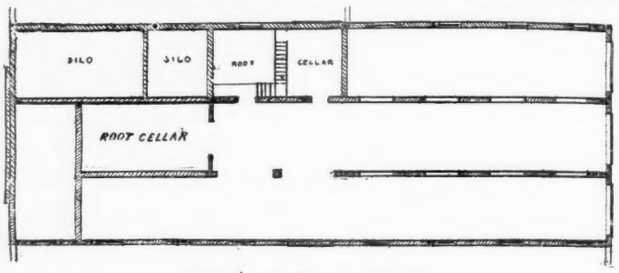


FIG. 1. PLAN OF CELLAR.

ground, must be cut with a platform reaper. If cut with a mowing machine the steel rake will leave much of it on the ground, and it will hardly pay to rake it up with wooden hand-rakes. There are several reaping machines that do the work to perfection. A movable

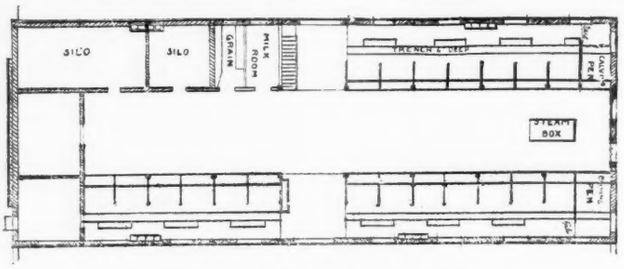


FIG. 2. PLAN OF CATTLE FLOOR.

cutter bar can be set so that the knives will shave the ground. The clover falls on the platform and can be carried, if the crop is light, quite a long distance and then discharged into a fair-sized cock. If the clover is dead-ripe then cocks or bundles may not need turning,

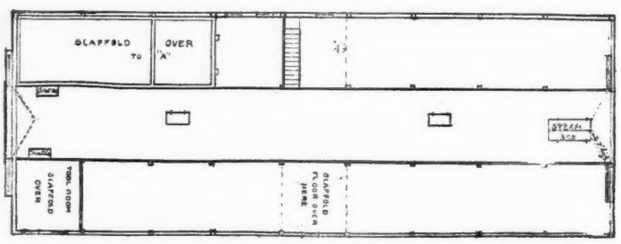


FIG. 3. PLAN OF MAIN FLOOR.

but can be pitched on the wagon with a barley fork and mowed away in the barn, or threshed at once. If it is difficult to get the crop dry put it on a scaffold, where it will dry out before it is necessary to thresh it.

In regard to threshing and cleaning clover seed, if one has had no experience, probably a good plan to get the desired information will be to write to the manufacturers of the threshing machine he uses. In sections where much clover seed is grown the threshers go from farm to farm during the winter months and thresh and clean the seed for so much per bushel. It is highly desirable on account of insect depredators that the area in which clover seed is grown should be extended. A good, average crop is five bushels per acre, and as ordinary medium red clover is a second crop—the first crop being cut for hay in May or June—the money for the clover seed is obtained at little trouble or expense. "But will it not exhaust the land?" In proportion to the money value, clover seed impoverishes the land less than almost any other crop we grow. We retain all the leaves, stems, chaff and roots on the farm and sell only the seed. A bushel of clover seed contains no more fertilizing constituents or plant food than a bushel of peas. It is good policy to grow and sow more clover seed. If one fears it impoverishes the soil he should take a part of the money and buy cotton-seed cake, or fertilizers. The exchange can be made at a big profit.

Spring-tooth Harrow.—Properly set, this is one of the best of implements for pulverizing the soil. To readjust the teeth uniformly, place the harrow on blocks of the desired height on the barn floor, then loosen the teeth and lower them till their points touch the barn floor, and then fasten them securely. The higher he harrow is raised from the floor, the deeper the teeth will stir.

A GREAT NEW ENGLAND BARN.

At the Hecla farm, in Uxbridge, Mass., there has recently been finished a barn of unusual size and completeness. It was designed by E. Boyden & Son, of Worcester, Mass., and was erected under their supervision. The building is one hundred feet long by forty feet wide, and thirty-five feet high. At the back the ground is lower and the height is seventy-five feet. It stands east and west according to the old New England idea, which after all had some advantages. The cattle yard is on the south side, thus making the barn serve as a windbreak and shelter.

The cellar, of which a plan is given in Fig. 1, is twelve feet high and is entered from the end. The main portion is in three sections. It is divided by arched brick partitions, but one post being used. The root cellars, as well as a space one hundred feet by thirteen, have cemented floors. The central passage in the cellar is used for the storage of carts and farm wagons. In the northwest corner, as shown in the plan, are two silos. The dimensions given for them by the architect are 12x14x16 feet for the smaller and 24x14x16 feet for the larger. Comparing the plans of the basement and cattle floors with these figures it will be noted that they occupy both floors. They are cemented on the bottom and made air- and water-tight. The total capacity is five hundred tons. The root room on the west end of the barn next the silos has a capacity of five hundred bushels. The cattle floor comes next above the basement. The plan Fig. 2 shows the neat and well-considered arrangement. All but seven of the double stalls are on the south side of the building. There are twenty in all, with space for two more utilized as calving pens. The arrangement of these double stalls is shown in the enlarged plan and section Fig. 4. The stanchions are on the partitions which divide the stalls. Each one has a drawer or manger which, when pulled out toward the passage, uncovers an iron watering trough, as seen in the illustration. These troughs were expressly made for this barn, and, as may be judged, are a great improvement upon the common methods of watering cattle. The water for use in the barn is supplied from a well, two hundred feet deep, at the Hecla mill. It is pumped to a reservoir on the hill from whence it is drawn to the barn. The supply is abundant at all times. The stall floors and gutters at rear are platformed on the main floor timbers. As shown in the sketch, the drainage gutter sinks into the timbers. The rear trench is six inches deep. Ventilation is provided for by means of fourteen ventilators. These go from cellar to roof. They can be cut off from any floor at will. At the eastern end of this floor in the central passage is the steam box. It is of galvanized iron, three feet by eight. Steam is supplied from a boiler in the cellar. The feed boxes on this floor are filled from the floor above by means of chutes, a method which saves much handling of feed. Gates on this floor are so placed that cattle can be driven in without interfering with other parts of the floor. On the north side is the milk room, seven by fourteen feet. Here the milk is strained and put up in family cans. This branch of the business is constantly growing and the number of these cans is already large. Next is the grain room, of the same size as the milk room; it is supplied with grain from the floor above. In the southwest corner is a large room for sand which is used for bedding. The sand is dumped into the room from the outside through a chute. On the third, the main or barn floor, as shown in Fig. 3, hay, fodder, and grain for feed are stored. On this floor the work of filling the silos is done. The farm machines are stored here. A seven by fourteen grain room on this floor is used for storing grain, from which it is drawn to the floor below. On this floor there is a scaffold in the center of the barn which carries a circular tank twelve feet in diameter and ten feet deep. This tank has hose connections and is kept filled with water as a precaution against fire. On this floor is a tool room, in the machinists' sense of the word, where the machines and fittings are overhauled as well as repaired.

The next is the fourth floor, very high in the clear, and having a large opening in the center some fourteen feet square. On this floor is a truck for elevating and carrying hay. The fifth or storage is in the peak of the barn, and is devoted to corn and oats. Chutes lead to the grain rooms below. The cupolas on the top of the barn are fifteen feet high by eight feet square, and have four windows each in the base, as seen in the side elevation, Fig. 5, as well as in the front elevation, Fig. 6, and the rear elevation, Fig. 7. One decidedly novel feature for a barn is the fact that it is lighted throughout by electricity. This not only gives ample light but reduces very greatly the fire risk. The dedication or opening of the barn was made the occasion of a festival at which some eight hundred persons were present and enjoyed themselves with music and dancing. It was a rare occasion, for the completion of such a structure, so well adapted for the purposes intended, marks an era which produces such a model in barn construction, and was quite worthy of prompt and full recognition by friends of progress.

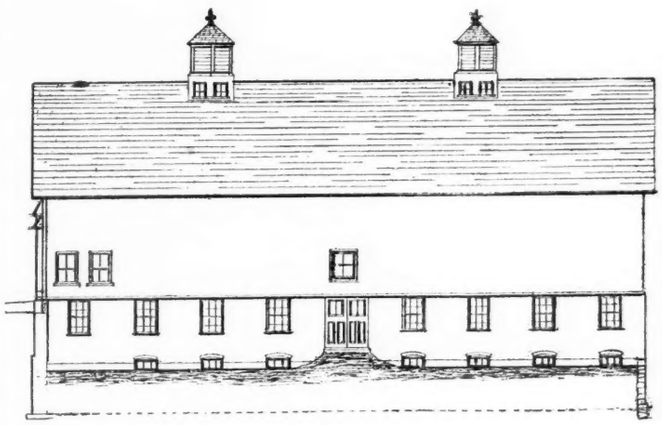


FIG. 5. SIDE ELEVATION OF THE HECLA BARN.

FIG. 6. FRONT ELEVATION.

FARMERS' CONVEYANCES.

HOLLISTER SAGE, CONNECTICUT.

Nobody has a better right than a farmer to drive for pleasure, or into town for business, in a well-painted vehicle, brightly varnished; yet few of them do so. "You can always tell a farmer by the muddy old rig he rides in," is a common remark not wholly without warrant of truth. However good the horses he drives—and many farmers own spirited, beautiful, and valuable ones—the wagon or carriage they draw is usually "a sight." This is not because the farmer never owns a good carriage or buggy, but because he does not take proper care of it. As a young man, perhaps, he kept a bright buggy, washing it occasionally with infinite labor, removing the dust every time he went to visit or drove with his "best girl." But after marriage all this involved too much work. He had "no time for it." And he still holds the opinion that clean, showy turnouts are too costly and troublesome for farmers. The truth is, few ever learn how to care for and preserve a nicely-painted carriage or wagon. To wash one speedily, thoroughly, and without scratching it, is an art that must be learned; to cover one and keep

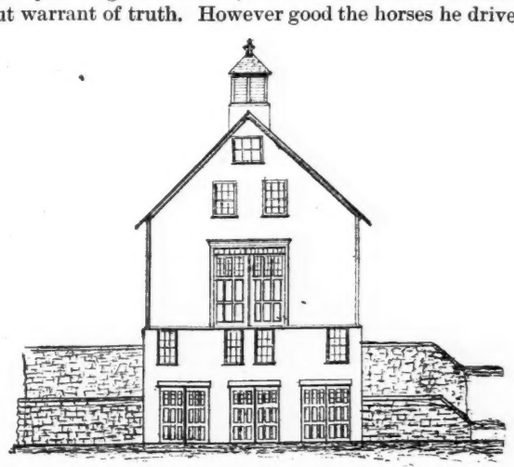


FIG. 7. REAR ELEVATION.

off dust, only a common-sense precaution that need take neither time nor labor.

A top-carriage of the best material and workmanship has three substances which, without care, will soon deteriorate; paint coated with varnish, a leather top, linings, and upholstery, usually of cloth. With watchfulness, and a fresh application of varnish whenever needed, the paint will rarely or never require renewing, and the varnish only will require care. It should never be exposed to the odors and heated ammoniacal gases of horse stables. Nothing more quickly deadens the transparency and brilliancy of even the best varnishes. To wash a carriage quickly and safely requires an abundance of clean water and a spot where the vehicle may stand to drain freely. Of course a hose gives the largest and easiest supply of water, but it must not be allowed to dash at full head, or the varnish will be scratched. A watering-pot with a hose nozzle is the next best thing. Every cushion, carpet, and rug must be shaken and dusted before washing. All signs of mud and dust should be removed from the body and top, inside and outside, before the gear is touched. This must be wetted meantime, as it is usually the dirtiest, and will be more easily cleansed after soaking. Before washing the wheels, every spring, brace, axle, and reach should be washed and the body carefully wiped dry with a soft, moistened chamois skin. Dipping the sponge into water (for a sponge and wagon-jack are indispensable to a quick wash), it must be applied to the rim as it slowly turns toward the operator, to prevent spattering the body, keeping the pail just out of reach of the moving tire. This catches much of the waste water, making it serve a second time, and invites frequent plunges of the sponge. Having completed the outer side of the rim, the inner side is next in order, and then the spokes and hub, first outside or from the body, and afterward next to it. Each wheel is thus washed and rinsed systematically and rapidly. For removing dry road dust a soft feather duster is convenient.

No dust can settle on the vehicle when housed if it is supplied with a soft cotton cover. For this canton flannel excels, but heavy unbleached muslin will do. A canopy may be made under which it is easy to back the carriage. A frame of laths just the size of the carriage top is covered and suspended two inches above it. To this the curtains are attached by buttons. The back and sides may be sewed in one piece. The front curtains should be ample in width to lap over the side curtains and exclude dust. Near the outer edge a dozen small rings should be sewed to the canvas. Through these a cord must be passed and fastened at the bottom. Directly above these rings two small pulleys attached to the ceiling will enable a person to instantly raise or lower this cover by the use of the cord. A cover is imperative, not only to catch the dust but also for protection against fading and rotting the linings and upholstery. The leather top should be gently rubbed over every three months with the purest olive or castor oil, to preserve its pliancy and prevent shrinkage. The care of a carriage described at length may lead some to still believe it laborious, but the terrors of the work and time required for its performance will disappear with practice and skill.

FATTENING THE HOGS EARLY.

F. D. COBURN, KANSAS.

A peculiar delusion which seems to have taken a fast hold on the minds of great numbers of farmers is that in cold or winter weather is found the proper and profitable season for converting corn into pork. Acting on this idea they pay little heed to beginning the process which is to change their lean and restless shotes to the dignity of "fattening hogs," whose business it is to rest, eat, and grow obese, until Jack Frost and biting winds suggest by no uncertain signs that autumn is rapidly waning. It is strange, too, that such a state of affairs should exist among the more intelligent. All experiments made in that direction demonstrate that in warm or moderate weather the conditions for realizing the utmost gain for food consumed are in every way most favorable, while in cold weather and exposed situations a large share of, and in some instances all, the food consumed serves as a mere maintenance ration, giving no appreciable gain. Those who begin fattening their hogs with the earliest of their new corn crop as soon as it is in "roasting ear," using stalks as well as ears, find it wonderfully efficacious in the animal's improvement, giving as large if not larger returns than when more matured, and enabling the feeder to have the benefit of thirty or forty days' feeding in the most genial season, which would be lost if he waited for the corn to ripen or become fit to gather for cribbing. The juices in the green stalks, leaves, and ears, seem especially adapted at that time of the year to the health and vigorous growth of hogs and, although making what might appear too bulky a food for fat production, it puts them in the best possible condition for finishing off to the greatest advantage later on more matured grain. In some carefully conducted experiments by Prof. Shelton, at the Kansas State Agricultural College, he found that in severe weather it cost, when shotes were exposed, about eleven and two-thirds pounds of corn to produce one pound of pork, while the same animals in like weather, but in a warm barn, gave a pound of pork for less than five and three-fourths pounds of corn. A summing up of his experiments in this direction indicated to him that putting increase on hogs exposed in severe weather cost about twenty-five per cent more than a like increase cost on hogs that were kept in comfortably sheltered quarters; also that of each bushel of corn fed to exposed animals an amount sufficient to make two and one-third pounds of pork was used up in merely keeping the animals warm. Such a tariff for warmth alone is more than the traffic will bear and emphasizes the importance of doing much of the fattening in autumn that is ordinarily done in November and December.

THE FIRST BALE OF COTTON.

DICK NAYLOR, TEXAS.

Down South it is deemed quite an honor to be the producer of the first bale of new cotton. The city to which the first bale is shipped also feels honored and never fails to either pay the producer a "fancy price" for it or to present him with a nice cash premium in addition to the price the bale brings. Houston, Texas, has probably received more "first bales" since the close of the war than any other city in the United States. Here is a statement of the first bales received since and including the year 1879:

1879	received July 9	1885	received July 22
1880	" " 12	1886	" " 18
1881	" " 11	1888	" " 6
1882	" " 5	1889	" " 18
1883	" " 8	1890	" " 8
1884	" " 22	1891	" " 6

All the above first Texas bales were received at Houston except the one of last year, which was received at Galveston. Georgia, however, beat Texas on the first bale last year, as one was received at Albany in that State on July 5. Georgia has beaten Texas on one or two other occasions, I think.

A widow, Mrs. M. Housman, who has a farm in DeWitt Co., Texas, has raised more first bales than any other individual in the South. Her 1889 bale sold in Houston, July 20, for $105, but the one she sent the preceding year brought $250. The 1889 bale was quite a small one, weighing only 367 pounds, making it cost a little more than twenty-eight and one-half cents a pound.

The first Texas bale last year sold in Galveston for $100, but the Galveston cotton exchange voted it a $100 premium in addition to the price it brought. It weighed 620 pounds, a good deal over the average size, and classed good middling. It was shipped from San Diego in Duval county, as was also the first bale of this year. The latter was sold in Houston on July 6 for $217.50 to Mr. J. F. Meyer, who generously donated it to the Bayland orphans' home. It was immediately resold, and was bought the second time by Messrs. Carson Sewell & Co. for $75. Nearly all first bales are sold by auction, and the public spirit of cotton buyers is manifested by the liberality of their bids.

It should be borne in mind that the date at which a bale of cotton is received at Houston or Galveston is always from one to three days after it leaves the farm where it grew. It is therefore ginned and baled several days earlier than the date of its receipt in the market.

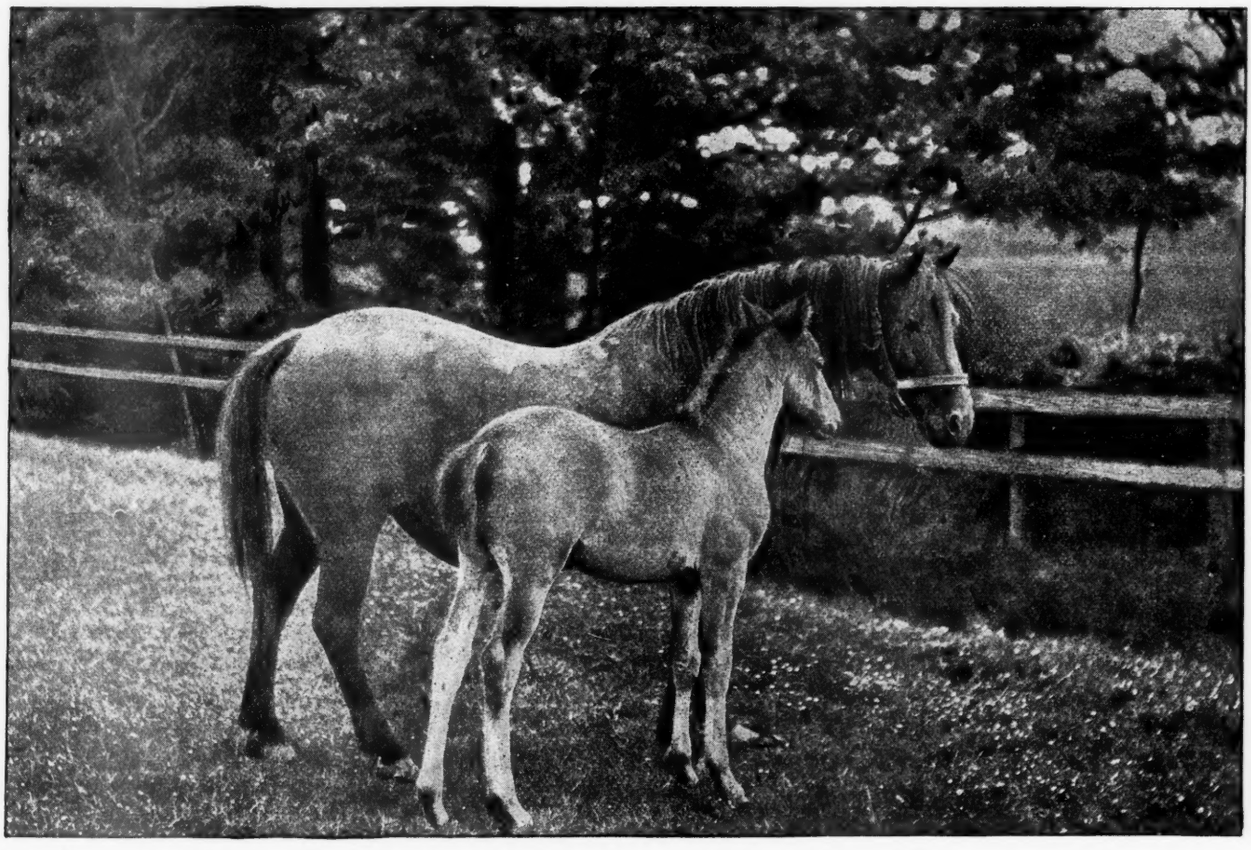
Pasture Trees.—There are more pastures in this country without trees than those that are provided with these blessings to livestock. There need not be many, but a few trees scattered over a farm not only add to the beauty of the landscape but carry with them the idea that the owner is merciful to his beast. The shade-tree may be productive of more than a shelter from the burning sun in midsummer, for in autumn it may bear a load of nuts that will gladden the hearts of the boys who have none too many things to cheer them in their life upon the farm. Chestnuts, butternuts, shagbark walnuts all furnish toothsome nuts for the winter evening, while protecting the sheep or kine in summer. A farm with trees sells better than one without shade. We have noticed that the treeless farm is most apt to be in the market. The farmer who plants or protects no shade-trees lets other important things escape through his fingers.

ENGLISH HACKNEYS.

There can be no doubt that in the beginning and middle of the last century Arab and Barb sires were used in England on trotting no less than on racing stock. But in both cases a few experiments were fruitful of the best results. These, when registered in the stud-book, became the recognized thoroughbred horse. The unregistered were the trotting horses which were required for daily use. One of these horses, sired by the famous Blaze (a son of Flying Childers and of a mare whose breeding was set down as unknown), won for himself more than a local reputation as the fastest and most staying trotter of the day. Of all his get two only appear to have inherited the sire's excellences. Drive, one of these, was very soon taken from Norfolk into Yorkshire, and there he remained until his death at a good age. The other, Scot Shales, remained in the Norfolk and South Lincoln district where he was foaled. To these two horses every hackney of to-day must be traced through sire or dam. They were both impressive sires, and they transmitted to their progeny out of thoroughbred, hunting, and trotting mares alike the even trotting pace and great speed which was then so much prized.

Yorkshiremen eighty or ninety years ago were as keen after a good horse as they are to-day, and perhaps the keenest of all was old Bob Ramsdale, of Market Weighton. Bob has been so cleverly drawn by H. H. Dixon ("Druid") that we can plainly see the old fellow at eighty years of age, in white stockings and shoes, long black coat, low, broad hat, and Kerseymere breeches, mounted on his Galloway, leading-rein in hand, and galloping down the street by the side of his famous old Pretender, showing the trotter's paces, every Wednesday in the season. This Pretender is at the root of most Yorkshire hackney pedigrees of to-day.

Norfolk breeders, having the choice of the Fireaway (son of Driver) as well as the Shale strain, mixed the two very freely, whereas Yorkshire breeders were more restricted in their choice, and even when Ramsdale at last secured Bond's Norfolk Phenomenon, the new addition was nearly pure old Driver strain. Perhaps this may fully account for the fact that Yorkshire hackneys have the prize shoulder, and more commonly approach the 15:2 standard; while the Norfolk horse, with better action, is more cobby, and there is great diversity in the height of the horses bred. The hackney mare in the accompanying illustration, engraved after an instantaneous photograph, shows most of the Norfolk strain. Now that hackney horses are becoming popular in the United States it behooves breeders of road horses to develop this industry. It is one that will be steadily remunerative for many years to come, especially as the hackney horse is the one above all others that will be used by the wealthy for the use of their families, both for harness and saddle purposes.



ENGLISH HACKNEY MARE AND FOAL.

GOOD FOOD IN A BAD SKIN.

RICHARD WAUGH, MANITOBA.

It is interesting to read the frequent inquiries made by farmers about the proportions of ordinary farm produce required to make a scientifically balanced ration. It is certainly desirable that all farmers should have an approximately accurate idea of the proportion of heat formers and flesh formers to be got out of an average sample of hay, roots, corn and ensilage, or other products with which they propose to feed their beasts. But it is to be feared that along with this apparent zeal for scientific insight there is often a laxity in the use of that equally valuable commodity called "mother wit." One of the first things to which an old-world farmer of the best sort would look out for in the beast he buys is what he would call "thrift," but which I would call the faculty of making the most out of the food of any sort that may be put before it. I have seen cases in which scrubs put up to fatten on concentrated food actually got poorer because their digestive apparatus was not in a condition to take one-half the value out of it that was being done by the better-managed and better-bred beasts put on the same rations alongside of them. This unthrifty habit and its consequences are what a Scotchman would call "putting good food into a bad skin" and those who have not paid special attention to the point referred to would be surprised to see how much a healthy and vigorous digestion has to do with the profit and loss on a beast.

Poor or unsound digestion may be partly inherited from a mother that is naturally of the same constitution, or has herself been improperly treated. A cow with unduly greedy or morbid appetite can hardly be expected to bear a thrifty calf. But the main cause of unthrift is usually traceable to the unwise treatment to which the

youngster itself has been subjected. Skim milk, sometimes sour, given at irregular intervals and in uncertain quantities, often out of a pail that has the residuum of forty previous feeds battered on it, is sure to bring on and aggravate unhealthy digestion, a distended stomach, and poorly developed frame as the natural consequence. Cattle require a greater proportion of bulky food than horses, and if the horse has a ration too poor in proportion to its bulk, or a growing heifer is fed a too concentrated ration, the evil effects will stay long after the particular cause has been removed. Irregular feeding, "a hunger and a burst," is sure to injure animal digestion, and if the farmer would look a little more into the habits of his herdsman he might get a much clearer guess as to the origin of unsatisfactory returns from his stale-fed steers than by sending the feed to a chemist for analysis. I do not wish to undervalue scientific research. No man can value it more, but I want a *quantum suff.* of good, plain common sense put into the lesson of which the tests for protein and carbohydrates are only partial exponents. Let me close with a practical application. Never buy a beast however good its pedigree that has had scrub treatment from its last owner, especially if it is a growing youngster. There is not a scientist on this Continent that can point out how that beast can be restored to the form and quality of which its former owner has robbed it by his ignorance, or carelessless, or meanness. If a calf is puny because its dam was meanly wintered during her period of pregnancy, no amount of good treatment after its birth will quite atone for the first loss. The best that liberal after treatment is likely to do for it will be to produce plump flesh. The proper proportion between bone and fleshy development is very unlikely to show up again in that beast that it may help to restore it in the next generation, if the sound management is kept up. Some time since I read in a Western stock paper a notice of the sale of some Shorthorn females of high lineage, which I have looked up to back up my own opinions. "They were in a miserable condition, and a disgrace to the grand traditions of their aristocratic family. The poor policy that has maintained them in poverty and allowed them to retrogress seriously in the direction of that most prepotent of all breeds, the original 'scrub,' cost their owner many thousands of dollars. Had the cattle individually been in fair keeping with their rich pedigrees, the average of the sale would have in all probability reached four figures. As it was the cattle sold wonderfully well considering their common looks and poor condition."

GETTING READY FOR WINTER.

MISS H. C. DUDLEY, KENTUCKY.

A few years ago we were told that a great deal of glass was an absolute necessity for a poultry house, but now it has been proved that in cold climates glass throws off more heat during the night than it transmits from the sunshine during the day, consequently much glazing is a disadvantage rather than an advantage. And in sunny weather and warm climates the chickens seek a cool, shaded spot rather than a brightly-lighted, heated house, more especially for their nesting places. Still, one or two glass windows are advisable during winter even in a severe climate; that is, if tight-fitting, solid wooden shutters are provided and they are carefully closed at night.

Another thing that practical poultry keepers have seen the folly of is having the perches far from the ground. Few old hen-houses have them less than seven or eight feet high, and many even more, and the poultry compelled to alight on a hard wooden floor, or in winter on the frozen ground outside. To the heavy breeds this is frequently a source of serious injury, causing in the roosters what is called "bumble-foot," a swelling and enlargement of the exposed tender portions of the feet, and to the hens resulting often in internal wounds. Where lighter breeds are kept these high perches teach them to fly, for which we afterward blame the enterprising young pullets and cockerels when a five-foot paling fails to restrain them.

If hens are to be the incubators for the coming season, the facilities for attending to them, while sitting and hatching, will be greatly increased if they have an apartment separate from the laying hens, and if no chickens are allowed to roost in either of the apartments devoted to the sitting and the laying hens much greater cleanliness may be maintained and consequently the danger from vermin will be lessened. If brooding hens could have a small run to themselves where they would not be molested by other fowls, and in which food and drink could be placed so that they might come off and feed at will, a much better hatch would be secured, with less time and worry from the attendant. The natural instinct of the fowls in such matters is a much better guide than our human intelligence. Besides, if a sitting hen has access to the general run, the other hens will have access to her nest. In the fall the fencing usually needs some repairs, either for security or to make the inclosures smaller, for as a rule it is better to restrict the flock to smaller range in very cold or stormy weather when a long range sometimes results in frosted combs and toes. On bitter cold days it is best to keep the whole flock in doors, and the house should be large enough to accommodate them.

During the summer and fall the thoughtful poultry keeper will provide winter food for his flock. If this is grown on the farm it must be stored in some convenient and safe receptacle, secure alike from the depredations of rats and from the inroads of the fowls themselves. In pleasant weather a few steps more or less count as nothing, but when the ground is instep deep in mud or half-frozen slush, with perhaps a drenching rain pouring, how thankful we are if everything is under one shelter. If the food is to be bought there is the more need of its being secured early, as there is then greater variety to choose from and it may be had at lower prices. Prices usually advance with the season, and all such things come cheaper when bought by the quantity. Sweet clover hay probably affords the greatest amount of nutriment for the price, and on account of its bulkiness it is especially valuable in winter when the diet of fowls is apt to be too concentrated. If cured in the shade, clover better retains its fresh green color and its strength, and when cut into half-inch lengths, scalded, steamed and sprinkled over with wheat bran it forms one of the most wholesome and valuable of foods. Next, provide some grain rich in albuminoids, as wheat, oats or buckwheat, some of each being preferable to any one alone. Last, but not least, a generous quantity of Indian corn which, though much has been said and written against it, has, nevertheless, a place of its own that nothing else can fill.

Winter vegetables, as potatoes, cabbage or turnips may be fed raw or cooked. The requisite supply of some sort of grinding material, oyster shells and sharp gravel must not be forgotten. A barrel of lime is of much use when conveniently placed so that a small quantity may be scattered about the house and yard once a week. Before the winter rains set in be sure to collect an ample supply of dry dust or sand. Even if the poultry house has a good floor it will be more easily cleaned if liberally sprinkled over after each sweeping and scraping, and where fowls are kept in confinement something of this sort is necessary as a deodorizer and to give them something to scratch among for exercise.

The long cold winter is the most trying season for the inmates of our poultry yards, and anything which we can do to lessen its severity or relieve its monotony will be gladly welcomed and promptly repaid by our grateful charges.

POULTRY BRIEFS.

Better and cheaper than staples for fastening fencing wire are 20-penny wire nails, driven in three-fourths their length and then bent over the wire by two or three blows with the hammer.

See that enough brooding coops are on hand; if not, make more. Those from last season should be neatly painted and put in good order. A chicken likes a clean, neat coop more than one would believe.

Scaly legs may often be cured by simply wetting the legs of the fowl affected occasionally with crude petroleum. When crude oil is not to be had conveniently heavy oil or grease can be mixed with kerosene, this tending to stay evaporation.

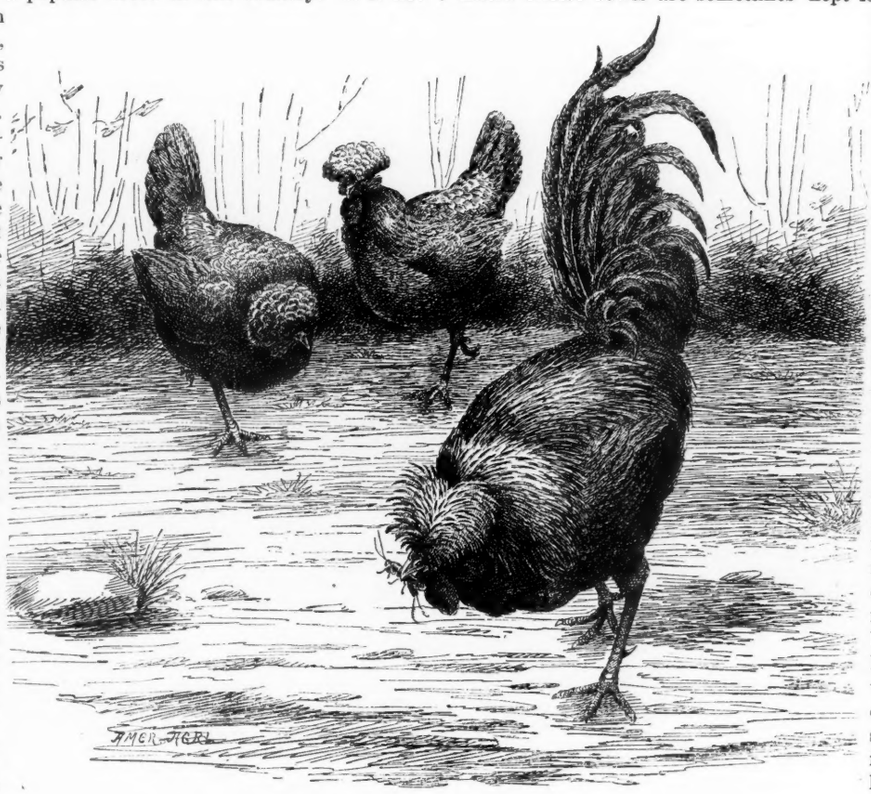
It is always better to have all sitting hens away from the layers. Let them eat by themselves, have a separate dust box, and remain quiet. A dark nest should be provided; they will sit closer. This assists toward a good hatch provided the eggs are fertile.

More new poultry houses have been erected on farms this year than ever before. The farmer finds the cow stable and barn not the place for fowls. He has now come to believe that there is something in poultry, and he is going to test the matter for himself Putting up modern buildings is his first step in the right direction.

During the holiday season last winter the supply of turkeys run out and as high as twenty-five cents per pound were paid for dressed fowls. Ducks and chickens had to be taken instead and even they commanded a high market price. Why not try turkey breeding; rightly handled it will pay in most sections of our country, and not materially interfere with the regular farm work.

BUFF-LACED POLISH FOWLS.

The Buff-Laced Polish is a very rare variety of the somewhat numerous Polish breeds. Of the eight recognized standard varieties, which by no means exhausts the list, it is, perhaps, the rarest of all. Polish fowls, everywhere and always, are decidedly attractive. The plump breast, the full tail, the well-rounded body, the graceful carriage, and above all the full, rose-like crests, causes the fowl to be "the observed of all observers" in every poultry exhibition, compelling admiration from man, woman, and child. And not only are they beautiful but they are among the best layers of the most prolific breeds. Especially is this so when attention has been paid less to crest than to practical qualities. Polish fowls, bred with a moderate-sized crest, are not easily surpassed among the breeds that are distinguished for prolificacy. They are non-sitters, which does not mean, as some suppose, that none of the hens ever sit, for in this sense there is no non-sitting breed; but which does mean that they are rarely broody, usually not until two years or more of age, and when broody are easily broken up. They lay a rather small, white egg, and lay especially well in the warmer months of the year. And yet the Polish is not a popular breed in this country. It is not extensively kept on farms, or by fanciers, and in most exhibitions is represented by few specimens or by none. Occasionally, as a surprise to the frequenter of poultry shows, there will appear a large class, as was the case at the late Madison Square Garden Exhibition in New York, and when such a class appears one begins to question why the rare is not the common thing. The fact is that the Polish is a rather delicate breed. The chickens are difficult to rear, and when about one-third grown, if they live to that age, have a surprising and disagreeable habit of dropping off. If they pass this age there is then a fair chance of their reaching maturity. Then, too, the crest, the great ornament of the fowl, is also one of its greatest drawbacks, practically considered, for when the rain descends it fills with water and the fowl contracts a cold in the head, which if neglected may result in roup, bronchitis, or induce consumption. Its small size, too, does not recommend the fowl to those who raise poultry for market. So that, despite its great beauty and its great prolificacy the fowl has not proved very popular in this country.



A TRIO OF BUFF-LACED POLISH FOWLS.

The Buff-Laced or, as it is frequently called abroad, the Chamois Polish, is the Bearded Golden Polish, with the black lacing changed to white or pale buff. It has a rich buff ground color, each feather laced or margined with pale buff or creamy white. The effect is delicate; some think it makes the fowl look sickly, while others regard it as exceedingly attractive. As this is a matter of taste it is not wise to argue the question, though it seems the latter is the better opinion. Certainly some Buff-Laced Polish are sufficiently handsome to call forth many exclamations of admiration.

It is altogether probable that it is descended from the Golden Polish, the change in lacing from black to creamy white being one that is by no means uncommon when fowls have been crossed. It is fair to presume that the crossing of Blended Golden and Blended White Polish fowls has produced this variety. Certainly the crossing of Black Red Game and White Games, and Brown Leghorns and White Leghorns, has given Pyle birds, the black being changed by the crossing to creamy white, the red remaining, and if this can be done it does not seem unreasonable that a cross of Golden and White Polish should result in a fowl where the golden body color was retained and the black markings had faded into creamy white, or pale buff as the *American Standard* describes the marking.

The illustration of this variety was made by our special artist from birds shown at New York and presents, as clearly as black and white can, the characteristics of this variety of fowls.

AUTUMN WORK IN THE POULTRY YARD.

JOHN W. CAUGHEY, PENNSYLVANIA.

Weeding out all the cockerels and pullets, for which there is no further use, should first be done. If for market solely they should be put in pens, the sexes separated to prevent quarrelling. There is no need of feeding and housing anything which cannot be used to advantage in breeding next season, and it is best to dispose of all surplus of doubtful quality. Older stock may also go along with such a lot, particularly three-year-old birds. It is unprofitable to keep fowls of either sex over two, or at the most three seasons. Extra choice fowls are sometimes kept longer and at times pay their way, but the rule is against keeping them longer than three seasons at the longest. It is very often better to ship good fat fowls direct to a commission house in some of the larger cities where the demand is steady and prevailing prices higher than the home markets allow one. This obviates much trouble, and a good, reliable house will promptly remit a check for the amount due less the commission. In the fall, when poultry is abundant, if fowls sell for one dollar a pair it is doing well; many marketable fowls and chicks net the breeder nearer sixty cents. If birds for breeding are kept over winter they will probably bring two or three dollars a head; sometimes as much as five dollars to ten dollars is obtained for choice stock. Clean up, remove nests and perches about the henhouses, painting or whitewashing all parts of the inside of the buildings. The nest-boxes and roosts should be painted, old nesting materials burned, and the roosts saturated in kerosene before putting up. Hooks should hold the roosts in place so that they may be quickly and conveniently taken down. Most of the nesting apparatus after being cleaned can be stored away until needed in the spring, to save lumbering up the building. The floor of the coop should have a fresh supply of sharp, clean sand, rather coarse, which should be renewed once a month during the winter.

See that there is a plentiful supply of clover hay, cabbage and other green food. It is essential to health, and nothing excels it for laying hens. A few barrels of road dust should be placed under cover for dusting purposes. A hen without a dust-box seldom does much in the way of laying. The roof and cracks in and about the building and about the windows will need a careful inspection, repairing and closing up all holes and cracks be attended to as the season for cold weather approaches. There are many things during the fall season that need looking after to maintain a healthy flock of fowls. The little duties about a poultry yard are far more important at the proper time than many plainly visible things that every one can see. Shirking is a very natural weakness. We want

to procrastinate and postpone such trivial affairs as come up until they multiply and add many unseen burdens for later on.

Until the latter part of November the fowls may be let out daily, except in very wet and stormy weather. Fresh air and exercise are of great value to hens, the former one of nature's gifts, the latter the propelling motion to stimulate health, and with a good layer this means plenty of eggs. Eggs are and will be the most valuable article that hens can produce from now until next April. Neglected hens seem to do anything else but lay; eat any and everything offered them, but when eggs are expected they are not forthcoming. Attention to a growing flock of pullets during the autumn will mean a return well worth the labor bestowed upon them, and they should begin laying in November or December and keep it up all winter.

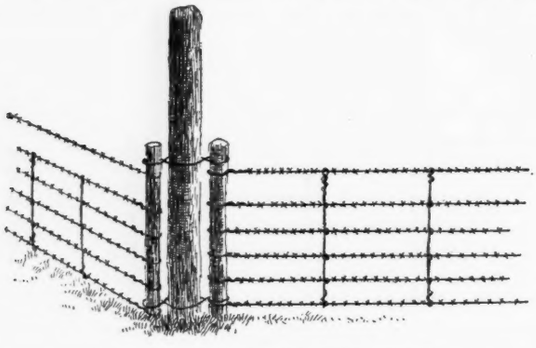
I cannot agree with those who put in artificial heating fixtures in a henhouse to make the hens lay. If a house is constructed to shut out cold winds and dampness, all is done that need be. If a hen will not lay there is something wanting besides an artificially-heated henhouse. Feeding has considerable to do with it—much more than many suppose. The secret of knowing how to feed them for eggs is a knowledge which can only be acquired through experience. The natural air of winter is healthy and invigorating to a flock of fowls, and even on cold days when the snow is off the ground exercise in the runs stirs them up and makes them feel new life. They will get quite lazy without exercise, and lose vitality; in cold weather, this is one reason why many hens do not lay.

Some who have brooding houses and rear large numbers of young chicks in the months of December, January and February, use artificial heat for the house and for this purpose it is not out of place, since a tender chick in winter needs much warmth. But for laying hens never use heat.

A PORTABLE WIRE FENCE.

JOHN C. UMSTED, KANSAS.

Two years ago I built a barbed wire fence around a four-acre clover field. The posts were set deep and the wires were stretched tight and placed close together. I put six wires in a space thirty



A SERVICEABLE BARBED WIRE FENCE.

inches high and although it restrained the hogs, the pigs and shoats up to fifty pounds in weight would get through. I then measured off a plat ten rods square in an adjoining clover field, and with a post auger set a seven-foot post two and a half feet in the ground at each corner, bracing them well. Two small stakes of osage orange, two and a half feet long and two and a half inches in diameter were fastened to each corner post by bands of No. 12 galvanized wire, as shown in the sketch. The wires were then stretched between the short posts, making a panel on each side ten rods long. A staple was driven around each wire and into the post to prevent its slipping up or down. The first wire was placed on the ground or as near to it as possible for, after the pigs have beaten a path around, it will be high enough. The second, third, and fourth wires were placed three and a half inches above each other, the fifth four and one-half inches above the fourth and the sixth six inches above the fifth. This makes a fence twenty-one inches high, which is sufficient for hogs.

Four three-foot stakes were driven along each panel and two rods apart. The wires were alternated on each side of the stakes, which takes up the slack, and then stapled fast. I took No. 12 galvanized smooth wire and cut it in lengths of thirty inches. These pieces were woven every four feet around each wire and act as stays to prevent the pigs from spreading the wires, and in a measure to give rigidity to the whole fence. In putting on these cross wires a pair of leather mittens or heavy gloves should be worn to protect the hands. Since building this fence I have had no trouble with pigs getting through. To move the fence all that is necessary is to remove the band wires from the corner posts, pull up the intermediate stakes, hitch a horse to one end and draw it where it is wanted. A spool could be made and the fence rolled up on a wagon.

A NEW MILK TESTER.

PROF. J. R. HUTTON, CONNECTICUT.

One of the prime elements of success in dairying at the present day is a knowledge of the commercial value of the milk handled. It is generally conceded that the value of milk for nearly every purpose is in proportion to its percentage of fat, and many attempts have been made to devise a satisfactory method of testing milk on the basis of the fat contained. To be of popular use such a method must be

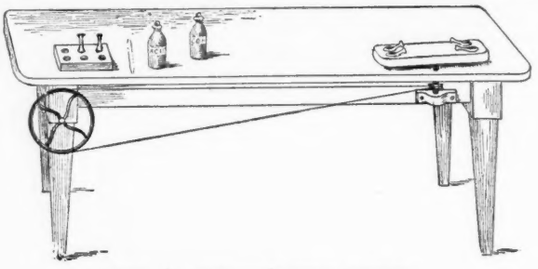


FIG. 1. HUTTON'S MILK TESTER.

rapid and simple, as well as accurate and comparatively inexpensive. The principal methods that have been tried are lacking in one or more of these requirements.

The machine and method here described are the result of an effort to cheapen and simplify still further the work of testing milk. The method, similar to some now in use, consists in mixing a measure of the milk to be tested with enough alcohol and sulphuric acid, and rapidly whirling the mixture to separate the fat. Fig 1 represents only one of a number of very cheap and simple machines, which any one can make, and only one way of attaching it. In this the test bottles, while being whirled, are supported in a piece of 2x4-inch scantling, fifteen inches long, centered on the upper end of the shaft. This is made of five-eighths-inch rod iron, eight inches long, with upper end squared and slightly tapered to fit into a square hole in the center of the whirler. The shaft turns in a block at the side and through a hole (with tin bearing) in the top of the table. A small pulley on the shaft is connected by a band with the wheel at the left, turning on a bolt through the leg of the table. One turn of the wheel makes about ten of the whirler, which should make about 800 per minute while testing. The capacity of the whirler is easily increased by making two cross-pieces, and still further by a continuous wheel. The cost of the machine is about fifty cents.

The work of making a test is briefly as follows: Amyl alcohol is added to a test bottle (Fig. 2) to a depth of one-fourth of an inch; the pipette (Fig. 3) is then filled with the well-mixed milk, and its contents delivered into the bottle. Strong sulphuric acid is added up to the neck of the bottle, a small cork held firmly in the mouth, and the bottle shaken vigorously until the curd is dissolved, and the contents become a hot solution of a light brown color. The neck is then nearly filled with weak acid (equal parts of strong acid and water), the bottle placed in the whirler, and whirled for about half a minute, or until all the fat appears as a clear yellow oil within the graduations of the neck, from which its percentage is read at once. The time required to make a test is about two minutes, and the cost for chemicals about one-fourth of a cent. Cream, skimmilk, and buttermilk, are tested in a similar way, if a fair sample can be obtained with the pipette. For cream a pipette delivering 4-5 grains is used, and the reading multiplied by three for the per cent of fat. One hundred tests require about one-half pound of alcohol, and five pounds of acid, both of which may be obtained from any druggist. The pipette costs twenty-five cents, the bottles fifty cents each. An accurate milk tester of some kind should be used by every farmer who has much milk to sell or butter to make. Its use will enable him to form an intelligent idea of the dairy value of his cows.

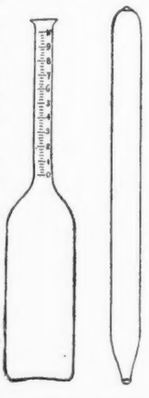


FIG. 2. FIG. 3.

OPIUM PRODUCTION IN THE UNITED STATES.

Considerable interest has been manifested at times in the cultivation of the poppy and the production of opium in this country. The subject is often discussed by the newspapers. In some of the great dailies have appeared articles which betray either gross ignorance or venality. An agricultural weekly of wide influence recently replied to an inquirer that opium was made from the *seeds* of the poppy. All the poppies contain opium in their milky juice, but it is most abundant in the *Papaver somniferum* or common annual poppy, with white or purple flowers. This plant is not indigenous in the United States but will grow in nearly if not quite all parts of the country, and in some of the Eastern States it has escaped cultivation and become a weed. A flowering branch and a seed pod are shown in our engraving.

Opium is produced by making slight incisions in the ripening seed-vessel, and collecting the partially-dried juice which exudes. This requires great care, as only the surface of the capsule is to be scarified. This is performed in the afternoon; the milky juice exudes during the night and, being exposed to the action of the air,

FLOWERING BRANCH AND SEED POD OF THE ANNUAL POPPY.

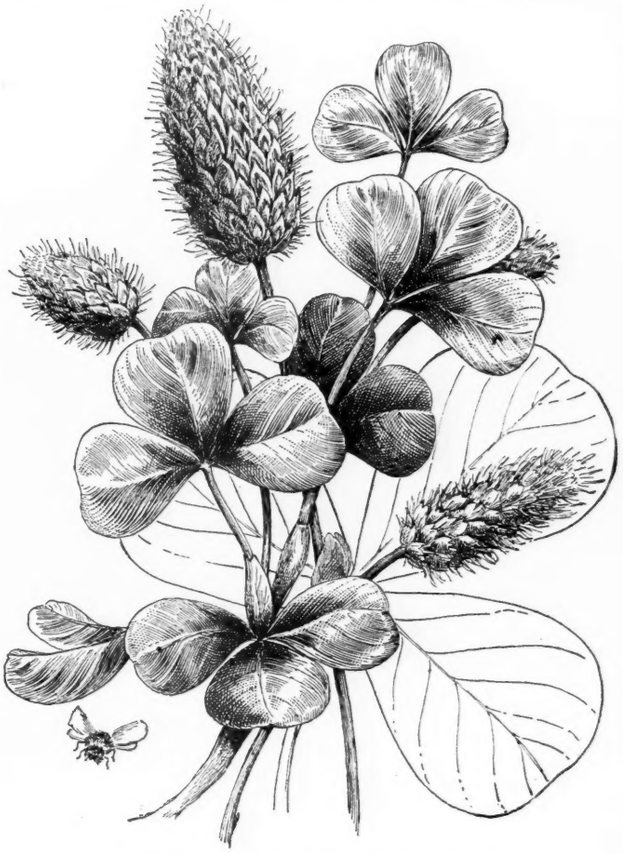
assumes a gummy consistence, and is scraped off the next morning. Successive incisions are made until the seeds in the capsule ripen. The requisites for commercial success are skill and extremely cheap labor. All attempts to produce opium in this country by the present methods must be made in direct competition with labor in India, which costs only ten cents a day. Various methods have been attempted for lessening the manual labor, but none of them have proved successful. A man in Florida has been advertising quite extensively his "new process for the cheap extraction of the gum from the entire plant, instead of only the capsule, as of old." He proposes to "make terms within the reach of all" by sending his "new process," "together with all formulas, etc., with private instructions on cultivation, for twenty-five dollars." To the average mind it would seem a little remarkable that a man who had an unpatented process of such value as he represents this to be should not guard the secret and make a fortune out of it rather than to "encourage those who are willing to go into this business." But the fallacious—not to say fraudulent—character of these representations is quite apparent from the fact that the gum cannot be made from the entire plant. Morphia, the essential alkaloid of opium, does not pre-exist in the juice even of the capsules, but is developed only by exposure to the air upon its exudation. The leaves and other portions of the plant yield a bitter principle upon distillation, but it does not possess morphia. The seeds yield a bland oil, which is largely employed in the arts but has no place in the *materia medica*.

Barnum once replied to a letter of inquiry from a Western farmer that it was true he had employed an elephant for plowing, but he could not recommend elephants as profitable team animals for the general farmer. In a similar sense opium production in the United States is practicable, but under present conditions it cannot be made profitable.

SCARLET CLOVER.

J. A. FULTON, DELAWARE.

Of late years scarlet clover has become a great favorite with the farmers of Delaware, and there are now perhaps ten acres sown for one a few years ago. The uses to which it is applied are principally three. First and most important as a fertilizer, especially on light and poor land where the commom red clover would not do well. On such land, when accompanied with a small application of



SCARLET CLOVER, FOLIAGE AND FLOWERS.

superphosphate of lime, it will make a fair growth. When in full bloom it should be plowed under and the ground tilled in any crop desired. But the most popular use made of it as a fertilizer is in our peach orchards. As soon as the fruit is gathered the orchards are prepared for the clover seed by plowing, harrowing, and rolling. The seed is then sown broadcast and brushed or rolled in. By brushing is meant the dragging of a large branch of a tree with the foliage on over the seeded ground, thus smoothing it and slightly covering the seed at the same time. The second use is for feeding green to stock. With dairymen and farmers who soil their cattle it is highly prized for this purpose. Many feed it to their horses also, and some veterinarians say that it is an excellent forage for driving horses, as it does not scour. The third use is to grow it for seed for market. When this is the aim it should not be cut till mature, and then early in the morning or late in the evening, as the seed shakes out easily by handling, and much will be lost if handled when very dry. The same care must be used afterward when curing to be threshed. The yield of seed is usually about six bushels per acre, and the market price about five dollars a bushel.

Although clover will do well on poor ground it will respond to

generous treatment and make a much larger growth in a richer soil. I have measured stalks over forty inches in length, and I have no doubt that it can be grown much taller and so rank that plowing it under becomes a serious task. When in bloom it is a brilliant and beautiful sight, and very striking to the eye. It is sometimes sown in the head rows, and makes a very handsome border. [Flower and seed spikes, and foliage are seen in the engraving, an average-sized leaf being shown in outline.]

FOOD FOR WINTERING BEES.

W. Z. HUTCHINSON, MICHIGAN.

In the Southern States and other sections where the winters are so mild that bees can enjoy frequent flights it matters little what the food is so long as it is not actually poisonous. That is, any kind of sweet like sugar, honey or even honey-dew will answer as food. In these mild climates little or no protection is needed. But as higher latitudes are reached chaff hives are required, and some care must be exercised in regard to food. As we journey still further from the equator it is only cellars and the best of food that bring uniformly safe results.

It has been asserted that honey is the "natural" food of bees, and that nothing is to be gained by substituting cane sugar. It must be remembered that the "natural" home of the bee is that of a warm climate where there are no long spells of confinement caused by continued cold. Honey is, of course, the "natural" food of bees, but this fact does not prevent their dying sometimes as the result of its consumption, when a diet of cane sugar would have saved their lives. In my opinion, food is the pivotal point upon which turns the wintering of bees in our Northern States. Food is the fulcrum, and temperature the long end of the lever.

The whole question in a nutshell is just this: The loss of bees in winter, aside from that caused by diarrhœa, is not worth counting. It is diarrhœa that kills our bees. What causes it? Overloading the intestines with no opportunity for relieving them. Cold confines the bees to their hives. The greater the cold the larger are the quantities of food consumed to keep up the animal heat. The more food consumed the sooner are the intestines overloaded.

In the digestions of cane sugar there is scarcely any residue. Honey is generally quite free from nitrogenous matter, being well supplied with oxygen, and when free from floating grains of pollen is a very good and safe winter food, although not as good as properly prepared sugar syrup, which never contains nitrogen, but does possess more oxygen. The excreta from diarrhœtic bees consist almost wholly of pollen grains, in a wholly or partly digested state, with a slight mixture of organic matter. What overloads the intestines of the bees is this nitrogenous matter that they consume either as grains of pollen floating in the honey or by eating the bee-bread itself.

Repeated experiments have proved beyond the shadow of a doubt that as a winter food for bees pure cane sugar has no superior. With this as an exclusive diet, bees never die with the dysentery; and if kept in a temperature ranging from 35° to 45° F. they are all but certain to winter successfully. The objections to the use of sugar as a winter food for bees are that every pound of sugar fed puts one more pound of honey on the market; the labor of extracting the honey and feeding the sugar costs something; the beekeeper often has a crop of honey that meets with slow sale, and he has not the money to invest in sugar. Some object to the use of sugar on the ground that it lends color to the cry of "adulteration." The use of sugar in this way unquestionably puts a little more honey on the market, but this ought not to weigh heavily against the certainty of wintering the bees. Neither need there be any labor of extracting the honey in the fall, as by proper management, such as contraction of the brood nest, the honey can nearly all be forced into the supers, leaving the brood combs nearly empty at the end of the season. What little honey remains in the corners will not be consumed until the next spring, when frequent flights will prevent all troubles that might arise from its consumption. With proper feeders (the Hedden, for instance), tin cans and oil stoves for making the sirup, feeding is not a long or laborious job. In regard to causing people to believe that by some hocus pocus the sugar that is fed gets into the surplus, no sensible person will be moved by such an exploded absurdity. Regarding the increased amount of honey that the use of sugar for winter stores puts upon the market, as with the talk about adulteration, it is overbalanced by the certainty of carrying the bees safely through the winter. The greater objection to this use of sugar is the advancing of money to buy the sugar while the honey may be unsold and slow of sale. The price of sugar is now so low that unless the price of honey drops in proportion there will be some additional inducement to use sugar for winter stores.

When sugar is fed it ought to be given early, as the bees then have a chance to handle it over, and in this handling its character is somewhat changed by the addition of the secretions from their glands. There is also an opportunity of sealing over the sirup when it is less likely to be injured by changes in temperature, by moisture, etc. If the sirup is fed late, it must be made thick, as the bees have no time to evaporate it; and something must be added to prevent the sirup from crystalizing. After repeated trials I give my preference to honey for this purpose. From ten to twenty per cent of honey is sufficient. September is early enough to feed. When feeding has been neglected until late, and the weather is so cool that the bees will not leave the cluster and go up into a feeder, it may be managed by filling the feeder with sirup and placing it under the hive. The heat from the sirup will warm up and arouse the bees, when they will come down and carry up the feed. But all cannot or may not wish to use sugar for winter stores, and many do not need to use sugar to aid the successful wintering of their bees. There is a great difference in localities. Where one has successfully pursued the same course year after year it is doubtful if a change would be desirable; but what shall the man do who loses heavily nearly every winter, yet cannot, or will not use sugar? Possibly he can so manage that his winter stores will come from a different source. O. O. Poppleton takes the ground that the best honey for winter stores is that secured from the most bountiful yield. There may be something in this, but I know of one locality where the fall flow is always the most abundant, and I might almost say *always* abundant, yet so surely will it kill bees that the most extensive beekeeper in that locality after an experience of many years kills his bees in the fall rather than attempt to winter them upon this honey by any method. But beekeepers can do this: notice if any particular kind of honey is more likely to give trouble, and then avoid its use as winter stores. Part of the bees may be protected on their summer stands, and part put into the cellar. In a warm, open winter the bees out-of-doors will stand the better chance; in a severe winter the odds will be in favor of the cellar—and their owner must take his chances.

SPOTTED FIELDS.

J. W. DARROW, NEW YORK.

There are to be found on almost every farm what may be termed "spotted fields." By this are meant fields which have defective places in them, where the crops have made a poor return. In this oat field there may be found a spot where the straw was short and on the stalks no heads. In that cornfield is a place where the ears failed to set and where there was scarcely any growth of stalk. Out in the meadows are thin spots where the grass forgot to grow, and yonder barren knoll in the pasture is evidence in itself that it is not doing as well as it should.

It is well to consider these significant hints furnished by the fields, and patch up the deficient places. Some one has said that he who farms poor land should always go about the place with clover seed in one pocket and gypsum in the other. This figurative expression may be taken quite literally by almost every farmer immediately after harvest, for the farms—particularly in the East—are few upon which no unproductive places are to be found. It needs not the chemist to analyze the soil to tell what these places need. Two things may be given as the remedy on nine-tenths of the farms, viz., manure and drainage. Let the barren spots be well covered with manure or fertilizer of some sort, and if the operation is repeated again in the spring so much the better. Let the wet places be drained and thus convert waste into productive land. Tile is a good investment on any land that needs it, for the land is virtually worthless without.

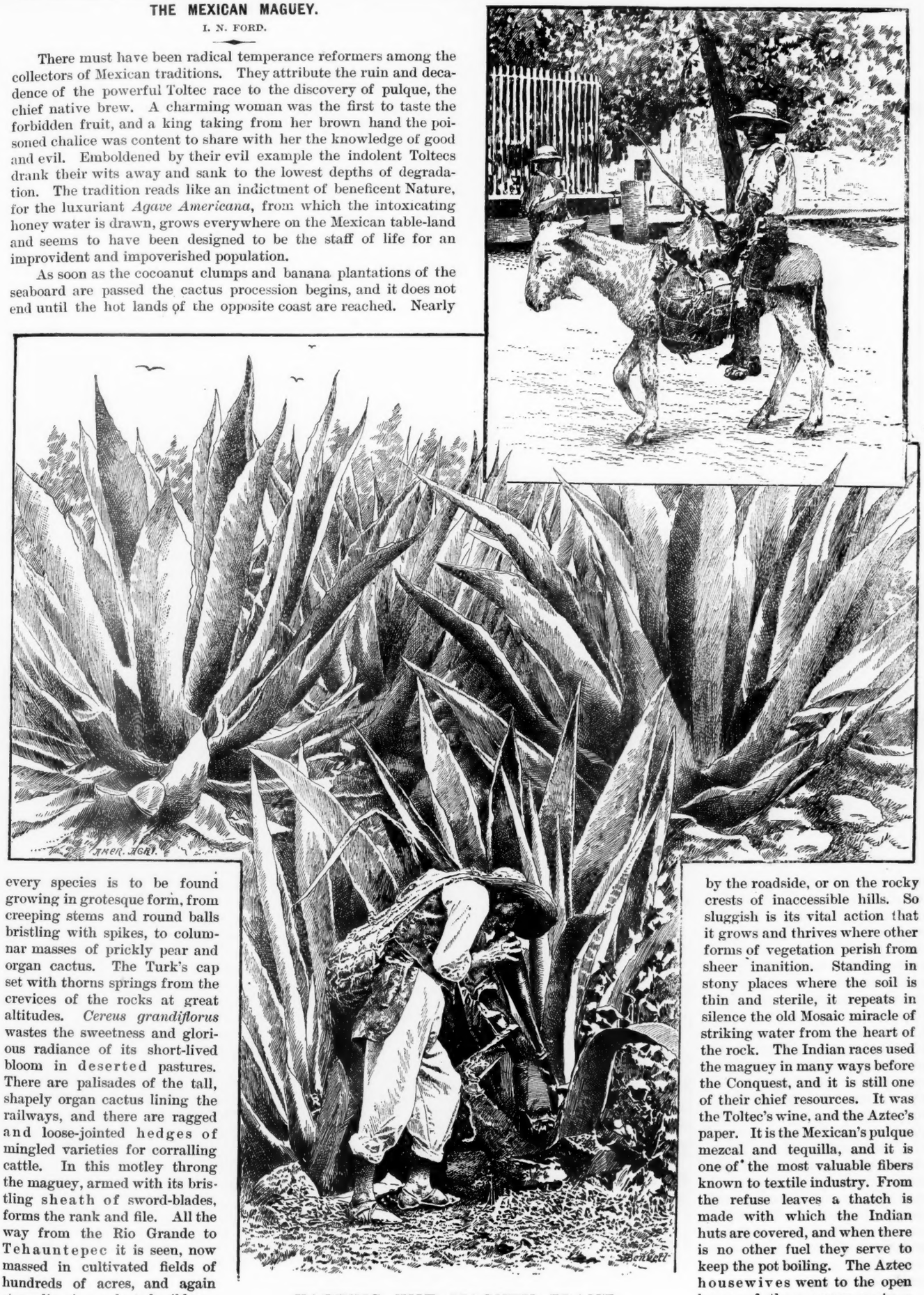
If intensive farming is to be the most successful farming in the future, then every acre and part of an acre must be made to produce its very best. Wet places must be reclaimed, half productive spots must be made to bear full crops, and wide brier hedges along the fences must fall before the bush hook. Rocks perhaps appear in patches, endangering plowshare, reaper and mower. They should be picked up and carted off. They are commonly heaped in some corner or along the edge of a field, where they are still in the way, instead of being hauled on the bad ruts and sags in the road, where they are out of the way and useful.

THE MEXICAN MAGUEY.

I. N. FORD.

There must have been radical temperance reformers among the collectors of Mexican traditions. They attribute the ruin and decadence of the powerful Toltec race to the discovery of pulque, the chief native brew. A charming woman was the first to taste the forbidden fruit, and a king taking from her brown hand the poisoned chalice was content to share with her the knowledge of good and evil. Emboldened by their evil example the indolent Toltecs drank their wits away and sank to the lowest depths of degradation. The tradition reads like an indictment of beneficent Nature, for the luxuriant *Agave Americana*, from which the intoxicating honey water is drawn, grows everywhere on the Mexican table-land and seems to have been designed to be the staff of life for an improvident and impoverished population.

As soon as the cocoanut clumps and banana plantations of the seaboard are passed the cactus procession begins, and it does not end until the hot lands of the opposite coast are reached. Nearly every species is to be found growing in grotesque form, from creeping stems and round balls bristling with spikes, to columnar masses of prickly pear and organ cactus. The Turk's cap set with thorns springs from the crevices of the rocks at great altitudes. *Cereus grandiflorus* wastes the sweetness and glorious radiance of its short-lived bloom in deserted pastures. There are palisades of the tall, shapely organ cactus lining the railways, and there are ragged and loose-jointed hedges of mingled varieties for corralling cattle. In this motley throng the maguey, armed with its bristling sheath of sword-blades, forms the rank and file. All the way from the Rio Grande to Tehauntepec it is seen, now massed in cultivated fields of hundreds of acres, and again straggling in neglected wildness by the roadside, or on the rocky crests of inaccessible hills. So sluggish is its vital action that it grows and thrives where other forms of vegetation perish from sheer inanition. Standing in stony places where the soil is thin and sterile, it repeats in silence the old Mosaic miracle of striking water from the heart of the rock. The Indian races used the maguey in many ways before the Conquest, and it is still one of their chief resources. It was the Toltec's wine, and the Aztec's paper. It is the Mexican's pulque mezcal and tequilla, and it is one of the most valuable fibers known to textile industry. From the refuse leaves a thatch is made with which the Indian huts are covered, and when there is no other fuel they serve to keep the pot boiling. The Aztec housewives went to the open leaves of the maguey as to a



TAPPING THE MAGUEY PLANT.

needlebook or workbasket in which to find pins, needles, and thread. The Indian women still use the thorns for pins and the longer spikes for needles, if they do not find their thread in the fiber of the youngest plants. When the honey water is clarified with lime, boiled down into sirup and crystallized after filtration—good, raw sugar is made. If the Indians' supply of corn and beans runs low, the roots can be cooked and eaten as food; and there is a larger percentage of alcohol to be extracted from them than from the leaves, or the juice. The maguey furnishes a substitute for gum arabic, and fiber for brushes, rope, cordage, hammocks, and a large assortment of manufactures. The natives obtain from it a caustic for healing their wounds, and American physicians, impressed by the fact that Bright's disease is almost unknown in Mexico, have brought pulque into use as a medicine and a tonic.

The maguey is the Century Plant which in Northern greenhouses sullenly vegetates but rarely blooms. Heat has a marked influence in promoting the growth of the stem. In Spain, the West Indies, and in the Amazon valley the agave matures in three or four years, but this rapid development is unfavorable for the production of sap. On the Mexican tableland it blossoms ordinarily in its eighth or ninth year, although by cultivation the process may be hastened. The growth is not so rapid as to exhaust the plant prematurely. In the dry, cool air of the elevated plateau it has more vigor and vitality, and when maturity comes it is converted into a vegetable well from which sap may be drawn three times a day for five months. It is not allowed to blossom, for the natural force which would be expended in the growth of the long pole and the beautiful yellow flowers is required for the production and storage of sap. The practiced eye of the Indian reveals the signs of approaching maturity in the straightening of the leaves and the shooting of the stem. Good judgment is required, for the volume of the produce depends largely upon the conditions under which the plant is tapped. The stem is cut off, the maguey is stabbed in the heart, and a bowl is scooped out for the collection of the sap. The tlachiquero closes the mouth of the wound by bending back the leaves and placing a flat stone in the center, or else by tying the sword-blades over it at the ends. When he repeats his visit he enlarges the cavity with a long, sharp spoon, until it is five inches in depth and seven inches in diameter. At morning, noon, and night he draws the sap with a clumsy but effective siphon. It is a long gourd, or sheepskin bag, with bits of sharp horn at each end. With one end the surface of the wound is rasped and the other is placed in the mouth. The sap when drawn into the acocote is carried to the fermenting cellar and poured into earthen jars or vats of undressed sheepskin. At the end of a fortnight it has fermented and is ready for market.

An ordinary maguey will yield two hundred and fifty cubic inches of sap a day. Very vigorous plants, like those seen in the high lands of Toluca will produce four hundred and fifty cubic inches in twenty-four hours, and not dry up in five months. Magueys under cultivation in good soil can be depended upon to furnish from a gallon to seven or even nine quarts a day. All the great haciendas in Central Mexico have maguey plantations, which are highly profitable. In a field of ten acres 1,200 plants can be set out from sprouts. The best soil is a light gravel, and no fertilizers are required. With cheap labor the cost of grubbing the ground and setting out the sprouts is trivial. Three cents for a plant will more than cover it, and for plantations of one hundred thousand magueys this estimate may be heavily reduced. The plants are left to themselves for six or eight years. When tapped at maturity each flows with milk and honey like a vegetable spring, and its produce is worth between $20 and $30. This enormous yield of gluten, water, and alcohol is from a plant not ordinarily over four or five feet in height. The maguey produces more alcohol than either sugarcane, potatoes, corn, or grapes.

Pulque, which is the fermented juice, is rank with alcohol and is a potent stimulant. It is very cheap, being sold everywhere in Mexico at a penny for a large mug, and it is the universal beverage of the working classes. Pulque is the strong wine or beer of the improvident peon, who celebrates every feast-day in the calendar. Fortunate he will be if he takes pulque alone on those festal days. In addition to pulque the maguey yields another and more powerful liquor, known as mezcal, and still another named tequilla, from a town in Jalisco. Mezcal is a Mexican gin obtained from juice extracted from the leaves and root, fermented with pulque and carried through a still. Tequilla is an alcholic whisky, and there is also a brandy made from pulque. The maguey plant has within it the promise and the potency of a well-equipped Mexican dramshop.

The tlachiquero and the pulque-carrier are familiar figures on the Mexican plateau. The former is an important personage on a large hacienda, and is supposed to be capable of taking care of three hundred plants a day. With his gourd and sheepskin bags he is a picturesque figure. The pulque-carrier with his donkey is seen on every country road and city street. He supplies the pulque-shops with liquor from his bags of undressed sheepskin, looking for all the world like pigs on their heads or backs. Women are largely employed in selling pulque on the streets and in shops, but the faithful maguey provides them with a more reputable and profitable industry. The plant in struggling to burst into bloom and furnishing gallons of sap exhausts itself and dies. The leaves are allowed to stand until the milking is finished, and then they are cut off close to the ground, washed with soapy water, and converted into ixtle, or Tampico fiber. It is largely a hand process, no machine for dressing the leaves having yet been invented that does not impair the strength of the fiber. The product is worth from ten to fifteen cents a pound when cleaned, so that a full-sized maguey after yielding a return of $20 or $30 in pulque is good for $3.50 more in ixtle. The Indian women have the patience required for dressing this fiber, and the work is done in their cabins and huts. The hemp which they send to the American market is of excellent quality, and there is an increasing demand for it, so that it promises to become an export rivalling hennequin in importance. On this account the invention of an improved dressing-machine is greatly to be desired. If the production of ixtle could be increased a hundred fold, the consumption of pulque would decrease, and that would be a great social gain for Mexico.

[In the accompanying illustration is seen a maguey field, with a tlachiquero in the foreground collecting the juice in his peculiar siphon. At the upper left hand corner a pulque-carrier is leisurely ambling along on his donkey.]

NOMENCLATURE OF JAPANESE PLUMS.

L. A. BERCKMANS, GEORGIA.

The explanation given by Prof. Tamari in the September AMERICAN AGRICULTURIST as to the causes which bring confusion in the nomenclature of Japanese names is in the main similar to that given by myself in a former article upon "Japan Plums," wherein I stated that "local names seem to be mainly used; hence a collector will send a number of plums which he has gathered in one district to California firms, while another collector operating in a different locality sends the same varieties to his firm, but under different local names, and thereby adds his quota of synonyms to the list. But, as the writer states, "Unpronounceable names by English tongues cause perplexity by altering the original sound," and this has also added to the incorrect names often found in catalogues.

The fruit referred to as "*Photinia Japonica*" is better known in the Southern States as "Loquat" and "Eriobothrya," and as "Bibacier" in Louisiana, but also as "Japan Plum" in some sections. In others it is called by its true name, "Japan Medlar."

Prunus Mume.—This, we are glad to find, is the true name for several varieties of Japanese plums received from various importing firms in California, under the name of Botankio No. 2, and *Prunus virgata* of Von Sieboldt. This type is unsuited to localities outside the orange zone, and is really an apricot. I had for some years past classified the Kelsey plum as belonging to a distinct group—this for convenient guidance merely—and this is indorsed by Prof. Tamari, who has given in his article singularly accurate deductions which will greatly facilitate the unraveling of the confusion now existing.

OXALIS.

More showy or pleasing plants for the window-garden than the bulbous oxalis cannot be found, and when properly managed none thrive better; as generally managed they are complete failures. This arises from the fact, in the first place, of their requiring full sunlight, and they will not flower without it. The next cause of failure is that the bulbs usually sold have been grown in the open ground during summer, and do not have sufficient rest before being started for winter blooming. The bulbs should be grown in the winter in the greenhouse in light, rich soil; in such, they will make bulbs very much larger than those usually sold. Besides, they will ripen off early in June, and be ready to start into growth in early autumn for winter flowers. The only two species worth growing are *O. Bowiei*, bright pink with large foliage and flowers, and *O. cernua*, clear, bright yellow and very floriferous.

A FAMOUS ARBORETUM.

For the last half century or more "Wadenethe," the country home of Mr. H. W. Sargent, near Fishkill, on the Hudson, has been famous for its wealth of rare trees, shrubs, and other plants collected from all parts of the world. No expense seems to have been spared in obtaining specimens of newly-discovered plants likely to prove hardy in this climate, and when obtained they were carefully planted, tended, and given room for full development, and, as a natural result, Wadenethe has become a kind of horticultural Mecca, to which all lovers of fine trees and other plants make pilgrimages for the purpose of learning something of the merits and value of the scarcer kinds and varieties. More than thirty years ago this place was briefly described by an able pen "as a bijou full of interest for the lover of rural beauty, abounding in rare trees, shrubs, and plants, as well as vases and objects of rural embellishments of all kinds." Three decades have not diminished their beauty but greatly enhanced it, especially in the earlier planted trees, for these have become grand specimens of their kind, with few rivals and fewer superiors in this country. In several instances the parent tree of our highly-prized varieties of indigenous species of trees are to be found here, notably the weeping hemlock (*Thuja Canadensis Sargentii*) and the weeping pine (*Pinus ponderosa Sargentii*), the latter planted in 1856, and now sixty-five feet high, with a stem six feet in circumference. But the treasures of this famous arboretum are far too numerous to refer to each by name at this time, and so we must pass them and merely note the glazed structures conveniently located about the grounds. There is a grapery 20x70 feet in which the choicest foreign varieties are grown, each vine carrying about twelve bunches, averaging about two pounds to the bunch. A nectarine house 10x20 and an apricot house 10x50 feet are devoted to these choice but, in our climate, rather uncertain fruits. A fine conservatory attached to the residence contains in their season a choice selection of the Japanese and Chinese chrysanthemums. A new, or recently-erected, palm- and orchid-house (shown in our engraving) contains many grand and rare specimens of these plants, all in fine health and growing vigorously under the skillful management of the gardener, Mr. Thomas Lester, who, we may add, takes great pleasure in showing his plant treasures not only to his friends but also to strangers who may pay a visit to these beautiful grounds and conservatories.

THE NEW GREENHOUSE AT WADENETHE.

Spare the Trees.—In England and other European countries no small portion of the wealth of the land-owner is represented by the timber in the hedge-rows and fences, but growing timber is more valuable in those countries than here. The farmers of the present should consider, however, that the time is coming when growing timber, especially of certain kinds, will possess considerable value in this country. Division and line fences, free from unsightly patches of underbrush, are desirable, yet a few symmetrical trees growing in these same fences add to the appearance of the landscape and to the value of the farm. Fifty or seventy-five years hence good oak or walnut timber will possess much value; therefore, the farmers of the present generation can add materially to the wealth of a succeeding population by taking care that trees of the more valuable sorts are left growing along the fences where it may be considered advantageous.

HOW TO HAVE BEAUTIFUL ROSES.

ELMER E. SUMMEY, NEW YORK.

A matter of prime importance in rose culture is the selection of a proper situation for the beds. If too near to the dwelling the plants will not thrive well. The distance apart for planting roses must be largely governed by the richness of soil, character of growth, and similar points which growers must decide for themselves. On an average three feet will be about right for an ordinary selection of varieties. When blooming, the flowers thus have ample space in which to develop themselves. Where one has a large number of strong growers of the Jacqueminot type four feet at least should be allowed between the plants. Until one becomes well acquainted with the characteristics of the variety grown it is well not to consider the first planting as final. In most cases at least half of the plants in the bed must be removed to other quarters in order to secure the best results from those remaining. One chief reason for there being so many failures in rose growing may be laid at the doors of the florists, who, thinking that they are doing a good work, have tried to find who could sell the most plants for the least money, and one may be quite certain that a large percentage of their customers will shortly denounce rose culture as a delusion and a snare. This result is due to the fact that from the very nature of the case the plants must be small, and if, as is too generally done, they are sent by mail, they are in so precarious a condition as to require the tenderest care of the most experienced grower, instead of depending on the tender mercies of the ordinary amateur. This is all wrong. Better by far get only two good, strong, two-years-old plants, of the hardy classes, for the dollar. Give them proper treatment, and in nearly every case they will prove entirely satisfactory. By investing another dollar the following year one will have a collection of fine roses in a brief time. Above all, order the plants to be sent by express, for if they are worth having at all they are worth paying the small charges upon.

All things considered, the autumn or very early in the spring is the best time for planting dormant hardy roses, as no plant suffers more from late spring planting. Pot-grown and tender plants

should be put out in the spring any time after frosts are past, as then they can become established before winter sets in. Where natural drainage is deficient the soil of the bed should be dug out to the depth of several feet, and a layer of broken stone placed in the bottom a foot or so thick, the soil then being put back. Unless the soil is very poor it will for the first year be better for the plants to receive no fertilizer, as manure might injure them before they become established. While a heavy loam or a clayey soil is preferable, sandy soil will do, providing special attention is given to fertilizing. For this purpose, every fall after the ground is frozen, the entire bed should receive a coating of five or six inches of well-rotted cow manure if obtainable, otherwise any manure will answer. The plants are better if previous to this covering they are pegged down so as to be entirely covered. In the spring all of this manure should be dug into the ground.

Roses are best on their own roots, but as there are some desirable varieties which do better on other stock it is necessary to pay attention to this class in the matter of deep planting, so that the bud or graft is below the surface of the soil. The variety will often in such a case throw out roots of its own, being in the meantime sustained by the borrowed roots. Fig. 1 represents a bush so planted which has made its first season's growth, Fig. 2 showing the same plant cut back ready for the second season. The main danger from roses on other than their own roots is that the foreign roots will often send up strong suckers, as seen in Fig. 3, which is the plant as it appears in the fall of the second season, the wild sprout being just ready to reach the surface with the arrival of the growing season.

FIG. 1. ROSE PLANT FIRST YEAR.

FIG. 3. ROSE PLANT SECOND YEAR.

Fig. 4 shows the same plant pruned, and also, indicated by a heavy mark, the place where the wild sprout should be cut off by digging down, when it first is seen above ground. At Fig. 5 is illustrated the effect of a sprout, *a*, starting as in Figs. 3 and 4, being allowed to grow, making a most vigorous rampant growth, drawing the nourishment to itself which should have gone to the improved variety *b*. In consequence the latter has made only a weak, unhealthy growth, with a few poor flowers, instead of presenting the strong, robust appearance shown at Fig. 6, which is as the plant in its second season should look, bearing numerous fine flowers. During the past season I have been pleased with the results of a trial which I gave the method of pinning down the strong shoots of last year's growth. A branch of the moss rose so treated was greatly admired. A Baron Prevost treated in the same way was far superior to plants as ordinarily grown, especially in the number of blooms, which at the same time were in no way inferior. Comtesse Cecile de Chabrillant, which is a lovely shade of pink, was also excellent, furnishing a long succession of bloom. General Jacqueminot was found eminently satisfactory, especially in the point of furnishing a much greater proportion of long-stemmed flowers, its general habit being to yield more short-stemmed buds than anything else. This method may be utilized by commercial growers for cut flower purposes.

FIG. 2. FIRST YEAR'S GROWTH CUT BACK.

FIG. 4. SECOND YEAR'S GROWTH CUT BACK.

FIG. 5. ROSE BUSH WITH GROWTH OF STOCK.

Additional good sorts are Mrs. John Laing, M. P. Wilder, Xavier Olibo, Captain Christy, Paul Neyron, Gabriel Luizet, Achille Gounod, Mabel Morrison, Madame Plantier, White Crested Moss, Gem of the Prairie, and the Japanese roses, *rugosa-rubra*, and *alba*. These will do well enough to start with, and by a little study of reliable rose lists one can readily increase his collection of fine sorts as rapidly or leisurely as may be desired.

Winter protection, even though the plants may be hardy enough to survive the coldest weather we may have, is essential to success. To secure the best results plants should not be allowed to consume their vital forces in withstanding climatic conditions when we expect them to yield either an abundance of fruit or flowers. Cover them with a strawy manure, or evergreen boughs, or similar removable material, in addition to the cow manure which is dug in in the spring. The best time for pruning roses is in March, and it should be borne in mind that strong, vigorous sorts like Gen. Jacqueminot, Magna Charta and Mrs. John Laing, need the least pruning, the last season's growth being cut back from one-third to one-half, together with removing some of the canes when there are so many as to not admit light and air to every part of the bush. Comparatively weak-growing kinds, as Baroness Rothschild, Capt. Christy, and Xavier Olibo, which are usually budded on other root stocks, should have from one-half to two-thirds of the previous year's growth cut off, together with the weaker of the canes. From all plants any partly decayed, or sickly, weak growth should always be removed; also when first planted all varieties will need more or less trimming.

FIG. 6. PERFECT ROSE BUSH.

Lima Beans in Winter.—There is no vegetable that compares with the Lima Bean for richness and flavor, and none so valuable for winter's use, or that can be had with so little trouble. When the bean is in a proper condition for table use, which is when the pod is full and shows a slight change in color, pick and spread the pods thinly in the sun, and let them remain until they are thoroughly dry; then shell and put away as other dry beans. When wanted for use soak in cold water over night before cooking, and they will be nearly if not quite as good as if picked fresh from the vines.

BROWN'S LILY.

The Lily family is a noble one, a family without poor relations, but one of the proudest members is *Lilium Brownii*, one rarely met. This is probably because of its high price, and quite as probably because of its rare beauty, as it is a singular fact that many amateurs are timid about growing a handsome flower or plant, even when it can be grown as easily as the more common. This lily should be grown in a partially shaded situation, in a deep, and rather light soil, but it will grow anywhere, only its preference is as stated. It should remain for several years undisturbed, mulched in winter to protect against frost, and in summer against heat. In early spring the soil should be removed carefully from over the bulb and the sets that have formed at the base of the stem taken away, the cavity should then be filled in with fresh soil. We have seen a clump of more than fifty plants, from an original planting of three bulbs, and a more magnificent sight we never beheld. Some of the stems

BROWN'S LILY.

were four feet in height, bearing from four to six immense trumpet-shaped flowers, purplish brown outside, and creamy white within. These were grown in the manner recommended, and with as little trouble as any species of lily.

THREE MEXICAN BULBS.

Some of the most peculiar as well as the most strikingly beautiful flowers have their origin in Mexico. A notable illustration of this may be seen in the three genera illustrated in our engraving. In bulbs and foliage they are as nearly alike as three different varieties of crocus; in fact, it requires a skillful expert to separate the bulbs when mixed, while their flowers are as dissimilar as any three known genera of bulbs. Yet they bloom simultaneously and require the same general treatment, which is precisely that of the gladiolus. They can be kept during winter in the same manner—dry, and in a temperature above the freezing point, a dark room being preferable, as darkness retards growth. There is another peculiarity alike with the three genera, that is not to be found in many other plants, namely, that the bulbs grow larger and produce more flowers here than they do in their native soil.

Milla biflora is a charming plant of slender habit, having small rush-like leaves, and tall, slender stems, each carrying from two to eight flowers, about two inches in diameter, with slender tubes nearly six inches in length, of strong outline, with a waxy texture, and pure white. Why the species was named *biflora* we could never understand, as we have had eight flower spikes from one bulb, and as many flowers on each. The bulbs should be planted in clumps not more than six inches apart each way, and the bed will be a mass of chastely beautiful flowers the entire summer, and there are but few flowers that can be produced with so little trouble.

Bessera elegans. This is a charming plant contrasting finely with the former, and certainly one of the most beautiful and showy of the whole class of bulbs. The reason that it is not more generally grown can only be that it is not better known. The

MILLA—CYCLOBOTHRA—BESSERA.

flower-stems are erect, from twelve to twenty inches in height, and considerably overtop the foliage. The blossoms are star-shaped and produced in umbels of from ten to thirty each, but two, rarely three flowers expand at a time, but these last for several days, and are immediately succeeded by others; they are produced on very slender stalks, hence are drooping, and, being bell-shaped, have a pretty effect. The flowers are about one inch in diameter, the outer surface being bright cherry red, while the interior is white, with a border of red on each division, and a conspicuous line of red running through the middle of each—an arrangement of color rarely seen in other flowers.

Cyclobothra flava, the last of the three, is quite as remarkable as the others; the leaves are entire, narrow, but not rush-like. The flowers are numerous, the color is a delicate citron-yellow. The stems on which they are borne range from six to twelve inches in height; flowers drooping and angular-shaped. They are by no means showy, but singularly beautiful, and contrast finely with their companion flowers illustrated in our engraving.

The American Agriculturist as an Art Teacher.

MRS. MAGGIE E. MILTON.

While looking through the August number of the AMERICAN AGRICULTURIST, I was forcibly impressed by the utility of the beautiful designs in art work; and the idea occurred to me that a few hints to some of our young friends, who do not have the conveniences of the city to enable them to cultivate their talents for art, would not be out of place. Those living in the country frequently have a few leisure hours which might be made interesting and sometimes remunerative if they only had something to aid and guide them in developing their ideas. I am satisfied that the art department of the AMERICAN AGRICULTURIST will be an invaluable assistant to all those who have to depend on their own ingenuity. The majority of young women, and not a few children, have a natural faculty for drawing and painting; after a little practice, they can soon learn to do outline work very well.

On Page 444 of the August number of the AMERICAN AGRICULTURIST, there are representations of the hop-plant louse, which would make a pleasing study for the little folks at home. Having drawn the outlines of the louse, to make the object more natural begin with a moderately soft pencil and put on touches of delicate shading; taking care not to make the shade too deep. It is indeed wonderful to see how these simple means of entertainment will assist an intelligent, patient mother in bringing to order and obedience a refractory child. The slate and pencil are indispensable to a child's happiness; such articles should be provided for each child in the nursery.

On Page 443 of the same number is a more advanced study for those who may have had some experience in art work. The cut is an artistically arranged cluster of gladiolus. In the design we can see the art of shading beautifully portrayed. The perfect harmony which is here secured by the proper blending of light and shade, the relief obtained from the effects of a dark background, the graceful curvature of the leaves render the picture exceedingly pleasing.

Page 441 has two lovely designs, the blackberry lily and a bunch of achimenes. Either of these would answer nicely for decorations on velvet, plush, or satin; but remember that the shade of your material must always harmonize with the colors of the flower.

There is a fine study for landscape painting on the 455th Page. The scene was taken in the Norwegian mountains, and if enlarged and properly executed, either in oil or crayon, the student would be well repaid for his time and work. For the lover of rural scenes, "A Summer Songster," on Page 449, will afford something delightfully refreshing. This picture is made up of little bits of meadow land in the distance; in the foreground a clump of leafless boughs, upon one of which is perched the Robin-redbreast, making hill and dale vocal with his song. The robin up among the branches, decked in his coat of grayish blue and red-brown shirt makes a pleasing contrast to the somber shades of brown and slate. The corner patch of goldenrod enlivens the picture. It seems to send a glow of sunshine over everything. Wood shades always harmonize with bright colors. Long shadows of trees, falling on the cool, green grass, give a softness to the otherwise too glaring tints.

I am an old lady now. Noble, strong-hearted sons have gone out from the parental roof, and often I sit alone here in my "Old Kentucky Home," with a high stack of the AMERICAN AGRICULTURISTS beside me, and as I take them one by one and turn the well-worn leaves my heart grows young again while the dear old pictures take me back to the time long ago when the "little boys" would sit beside my chair to hear mother read to them the ever delightful stories in the magazine. Never since the day when my husband first presented me with a copy of the AMERICAN AGRICULTURIST have we felt that we could afford to do without it. We can truly say that the magazine has been the schoolmaster in our family, and we hope never to bid it adieu.

Ferns in the House.

KATHARINE B. FOOT.

Few people can afford to buy flowers in winter for the decoration of the dinner table, and yet even a green leaf is grateful to the artistic eye when all is cold and frozen outdoors. The greenhouse ferns sometimes grow well in the house, but far more often they are miserable and sickly plants, and anything except an ornament or a rest to the eyes. And outdoor ferns brought in do not look even as well as the others. They very often die outright and seldom really flourish. The trouble with them is just this: Our native Northern ferns must have Nature's own rest, which is dying down and freezing hard. If they are taken up and brought in doors before that they get no rest, and as a matter of course will not grow well. They can be brought from the woods in the fall and potted, and then left out until after a week or two of very severe weather. The pots should, however, be sunken into ground; and they always do better in porous pots than in anything else; although they will grow with care in tin pans if they have proper drainage. The pots may break when sunken in the ground, but as their cost is trifling it is easier to slip the plants into another pot than to dig them out of the frozen earth. When the plants are brought in, they must not be put too suddenly into a warm room; for it is necessary to come as near as is possible to the gradual awakening of spring. They must not be kept too wet; and yet they must be wet enough. To raise ferns in the house takes care and infinite patience, but in the end it pays; for the gradual and daily growth of ferns is a very fascinating thing to watch. The pushing of the delicate curled fronds is quite a new sight to many grown people and to almost all children, and the unfolding of the leaf is even more wonderful than the leafing and blossoming, with which people who have not made a study of ferns are more acquainted. They can be dug out of the ground in the woods in winter and, though it is hard work to dig them, they perhaps do better than when they are potted and then allowed to freeze. Take plenty of their own leaf mold with them. If you carefully mark where a fine clump has died down before the snow comes, so that you can find it under the snow, it is perhaps the best way to get them; or they can be dug up and set out in the garden where it is easy to get at them, for one cannot get into the wood roads very well in winter time. They will grow for poor town dwellers who have not even a backyard in which to sink the pots for a freeze, but they will not do so well as if the pots are sunken in the earth. It would seem almost unnecessary to say that no plants grow well in glazed pots if so many people were not found every winter wondering why their house plants do not grow and anxiously tending them in glazed pots which allow no evaporation.

Thought is Economy.

GORHAM SILVA.

If the house-mother of limited means made a study of the food she provided for her family there would be larger variety and a marked decrease in the expense of household living. Often she is slave to a custom inherited from a liberally disposed great grandmother, of that period when bear, venison, rabbits, and partridges were abundant, and from her grandmother, who lived at a time when beef and mutton sold at eight and ten cents a pound. The nineteenth century housewife of limited means follows in their footsteps, and gives her family meat three times a day. She acts from traditional lights; is satisfied she is doing that which is for their well-being. Alas, she has never pondered upon the subject. Beaf steak, pork steak, mutton chops, ham and veal cutlets are easiest remembered and easiest cooked; as a consequence they are bought for every meal at an extortionate, poverty-breeding price. A little thought, a little investigation, if she could be brought to believe it, would relieve her of much self-denial in stretching her housekeeping allowance, and leave her money for personal adornment and those graceful house comforts and decorations so dear to the heart of a womanly woman. The following suggestions may open up possibilities of economy to these flesh-serving wives and mothers:

Beef's liver and heart, calves' heads and livers, pigs' heads, tongues and hock, if properly dressed, furnish most appetizing breakfast and supper dishes, are suitable for a dinner "entree," and cost less by half than the solid meats served at these meals. With the exception of the very wealthy class, who as a rule are judicious livers, we eat too much solid, greasy food. We ignore the thrifty "*pot au feu*" of the French, fail to appreciate the English relish, a crisp cooked rasher of bacon, or tasty broiled bloater at our breakfasts. We are equally indifferent to our own simple, wholesome dishes, broiled mackerel, smoked haddock, frizzled smoked beef, corned beef hash, and dropped egg on toast at our morning repast. Beef steak, chops, ham, and cutlets prevail at all meals and seasons. Try the innovation of less heavy meats at morning and evening, good housewives, and I guarantee the brains of your family will be clearer, spirits lighter, and, what will substantially reward you, your housekeeping purse will be heavier by many solid dollars.

To Make Clothing Last.

If shoe buttons are always resewed through the holes originally made they will not tear out. If kid shoes are occasionally thoroughly rubbed with a little vaseline they will wear longer than if blacked often. If a circular or oblong piece is cut from the legs of old hose and securely fastened to the wrong side of new ones at the knees they will be far more serviceable. If the edges of the patch are not turned under, and it is cross-stitched with strong cotton thread it will not be noticeable. The heels of woolen hose should also be run, as our grandmothers did their hand-knit ones in former days. In making children's hose from the discarded ones of adults turn the edges down narrow and sew the seams over and over. Worn underwear is best sewed in the same way when it is cut down for children; for if sewed on a lock-stiten machine it will break continually. The best parts of worn garments should be saved for patches. The legs of cotton and merino hose are good for the same purpose. As soon as the elbows and knees of woven underwear show signs of wear put a patch under. Do not wait until a hole is worn through. Bias strips of muslin are better for rebinding the necks of such garments than tape. All bands of muslin garments should be made lengthwise of the goods. All hems for buttons and buttonholes should have an interlining. Hamburg embroideries should always be washed before they are sewed. Balbriggan or gauze woven undergarments are more serviceable and economical than muslin ones. A sleeveless, half-fitting cotton underwaist, with two rows of buttons at the bottom for attaching the drawers and skirts, is an excellent garment for children. Skirts can be cut off and refinished at the lower edge when worn, and lengthened by adding a round yoke at the top. All colored skirts should be bound with braid at the lower edge. Calico or gingham is more economical than cambric for lining the skirts of common dresses, especially for children, as it can be washed and used a second time. In making work dresses, or those for children, put a piece of the material (matching the pattern) between the lining and outside at the elbows, the top of the underarm part of the sleeve, and the underarm gore of the waist. These will be found convenient for patching as the garment gives way. A tear in worsted goods should always be darned with ravelings of the same material and afterward pressed on the wrong side, with several thicknesses of cloth underneath. A dress skirt or drapery can be lengthened and the joining covered by flat bands of trimming by placing the two edges together, but not lapped, and cross-stitching them upon a thin lining. A hole in black silk or satin can often be nicely mended by placing a piece of court plaster on the wrong side. A weak place in kid gloves can also be strengthened in the same way; and if a break occurs where there is much strain add a piece after darning. Do not use arnica plaster, or it will adhere to the hands. Garments should always be freed of dust before they are put away. The air is a great renovator; if garments are hung away nicely for a season they will look decidedly better. Sponging garments with tepid water to

which ox-gall has been added will freshen them decidedly; and every one knows the virtue of ammonia in this line.

A Warm Bed-Gown.

FRANCES H. PERRY.

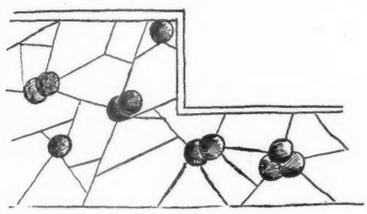
For mothers with little children who are restless at night, for invalids who are often in and out of bed, for those who have the care of the sick, or for any one liable in any way to be exposed to sudden changes of the atmosphere after disrobing for the night, the bed-gown herewith represented is invaluable. It may be made of any quality of flannel from blanketing to soft, warm dress flannel—even dark or mixed blue shirting flannel being very pretty when finished with contrasting blue or cardinal cashmere collar, cuffs, pocket-laps and foot border. Unbleached Canton flannel trimmed with Turkey red twill is very warm, pretty and inexpensive; it may be made up either side out, as preferred. The twill collar, cuffs and foot-border — which turns up an inch or more on the wrong side like a binding—protect all of the edges which would otherwise be easily soiled, and, if a thin cotton nightdress be worn inside, the gown may be used a long time without need of cleansing. Any home dressmaker can cut one. The two fronts are straight, with four shallow plaits each side of the neck opening, and are about twenty-five inches wide at the bottom. There is an underarm gore, about half as wide at the bottom. The back has a full, double box-plait in the center and is slightly gored off at the sides to fit the curve of the side gores; it is twenty-seven inches wide at the bottom, or it may be wider if one chooses, and the cloth allows. The sleeves have but one seam and are well arched over the shoulder. The back and front linings extend an inch or two below the arm's-eye (which is quite large), the latter reaching only to the front plaits; the back box-plaits fall loosely below the lining. The cuffs may be turned down for warmth, or up for convenience when at work. There is a breast pocket for the handkerchief, and a handy pocket on the right side. The fastening is performed by safety or spring hooks, so there are no buttons to hurt the wearer or the one cared for, or to catch into tangled locks or baby's trimmings. The gown should be amply large enough to slip on easily over undergarments or other nightdresses; and a hooked belt, of the trimming goods, will be found a convenient addition when the wearer is not lying down.

A COMFORTABLE NIGHT-ROBE.

A Chamois Button Bag.

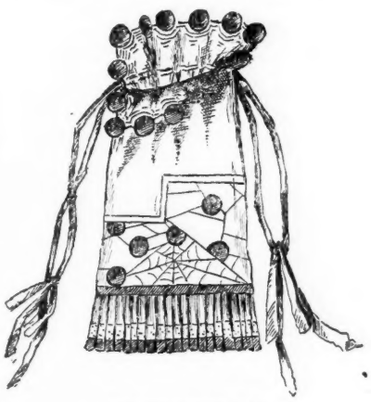
ISABEL GORDON.

To make this bag choose a piece of the softest, palest chamois you can find. If it has a yellowish tinge, leaving it in the sun for a day or two will bleach it to a pale creamy hue. Cut out a piece



SPIDER WEB DESIGN.

twelve inches wide by eleven long. Pin it tight to a board, and along the edge which forms the mouth of the bag lay ten cent pieces half an inch apart. Mark around them with a pencil. In all, with the four at the left side, where it is slashed down, you ought to have twelve of those tiny disks. Now sketch the design, as given in the illustrations, on the lower part of the bag, leaving two inches at the bottom for a fringe. In sketching remember that the decoration at the top is inside, which makes your work come on different sides. Begin to color the disks at the mouth, using oil paint mixed with a very little turpentine, rubbing it in with a short-haired, stiff, bristle brush. For the first disk use rose madder and white, shading it from a rich crimson to pale pink. For the next use cadmium white and burnt sienna, shading it from mahogany to a vivid yellow. Paint the third one in blues, using Antwerp blue and white. The fourth make green, with white and Zinnober green medium. Continuing coloring the rest in the same order, commencing again with a pink one. Then fill in those at the bottom with the same coloring, only taking care to group harmonious shades together. Paint the tiny band at the top of the fringe a bright pink with white and rose madder. Before you slash it finish the fringe. Tint the stripe along the bottom a rich blue. Then get out your bronzes and with gold paint two thread-like lines about an inch apart. At the top of the blue band, between these touch in dots of blue, pink and gold in as irregular fashion as possible. Finish the cobweb and crackle work in gold. Also outline the disks with it. The first line inclosing the design paint in copper bronze, the one above it in gold. Now finish it at the mouth, outlining the disks and sketching a few wavy lines around them in gold. Leave your chamois stretched until the next day, when it ought to be dry. Just above the fringe run a line of machine stitching, which you can afterward cover with a touch of gold. Cut out carefully around the edge of the disks at the top. Turn inside out, bring the two sides together and stitch them very neatly with cream silk; then



THE FINISHED BAG.

slash the bottom into fringe. Two inches from the top cut a row of slits an inch long and run in two narrow ribbons for draw-strings; one a pale creamy color, the other Zinnober green. Tie them in long looped bows, and your button bag is finished.

Knitted Mats for Dining-Table.

M. B. HOWARD.

These mats are knit in three sizes. For the largest size cast on thirty-six stitches, for the next size cast on thirty stitches, and for the smallest cast on twenty-four stitches.

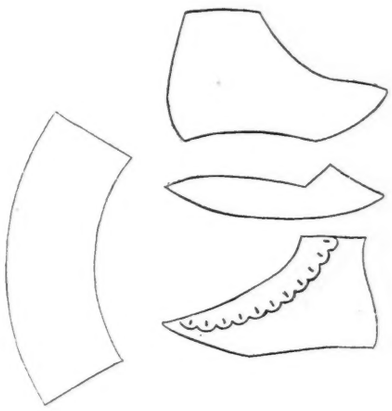
1. Knit three, turn, **and knit** the same three stitches over again.
2. Knit six, turn, and knit the same six stitches over again.
3. Knit nine, turn, and knit the same nine over again.
4. Knit twelve, turn, and knit the same twelve over again.
5. Knit fifteen, turn, and knit the same fifteen over again.

Now continue the rest of the stitches in the same way, only knitting three more stitches each time; and, after knitting to the end of the needle, turn and seam back to the beginning. This forms a gore, and it takes twenty gores to make a mat. After knitting the last gore do not seam back to the beginning, but bind off the stitches, and then sew the mat together. After making the other two mats crochet a border of red Saxony yarn around each of them. The materials used are two knitting needles and a ball of knitting cotton No. 10.

Homemade Shoes.

MRS. M. J. GORTON.

What boy can be happy with torn shoes or a patched jacket? What girl can make a creditable appearance when her shoes are shabby, her dress too short and out at the belt, and she has no other to wear? Handsome, neatly-fitting shoes, made of strong beaver, tipped with leather, can be made at



PATTERN FOR SHOE.

home with the exception of the necessary shoemaker's work needed in joining the uppers and soles. Visit the tailor shops and buy your clippings. Five cents' worth will give you enough material for two pairs or more of children's shoes. Line with strong drilling, make on the sewing machine, tipping the toes and heels with kid or morocco taken from the unworn portions of worn-out home shoes. The shoemaker will supply soles and join at a small cost.

A Cheap and Charming Playhouse.

L. B. PIERCE.

In the fall of the year, when large dry-goods stores are getting in their new goods, the sidewalks are blockaded with large boxes, which can be bought very cheaply. I obtained some last year for twenty-five cents each, which contained about a cubic yard each of space. The exact size was 32x34x47 inches. While they were lying in the backyard where they were unloaded the children captured them and constructed a playhouse after the manner of the plan shown. One side of each was removed and the boxes set with the open sides together, so each formed a room, opening into adjoining ones. The rooms, as will be seen, are numbered from 1 to 5, while 6 and 7 are porches, floored and covered with a part of the sides taken from the boxes. The four doors, repre-

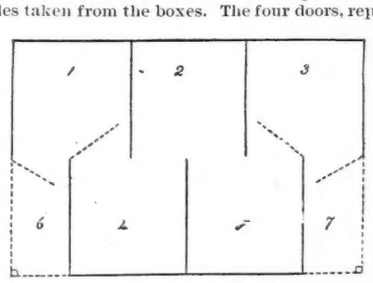


DIAGRAM OF PLAYHOUSE.

sented by the dotted lines as opening upon the porches from rooms 1 and 3, and opening into the same from 4 and 5, are made of the same. There will be enough lumber left to make cupboards and benches inside. If the boxes are set on three pieces of scantling alongside a carriage-house or barn, and covered with a cheap board roof, the playhouse will be available in stormy weather, and books and toys will be dry and secure. The boxes may be spiked to the scantling and secured to each other near the top with small carriage bolts. A playhouse like this, neat and tight, with several separate rooms, is a bonanza to children,

and will relieve a mother of much care. Small holes, of a heart, crescent, or star form, may be sawed in the outer sides to admit light, over which bits of glass may be tacked. If the house is against the side of a building the rooms 1, 2, and 3 should be three or four inches higher than 4 and 5, giving an abundance of light through the opening, which may be closed with a bit of board, hung with leather hinges. The height of the boxes (forty-seven inches) is greater than that of many coal mines where men work all day, and is sufficient for children young enough to enjoy a play-house. With boxes at twenty-five cents each the entire structure, including a board roof, may be constructed for less than three dollars, and will last for a number of years, and then be worth something for kindlings.

Such boxes are the cheapest form of lumber I can get to make plant flats of, and I purchase them for that purpose.

To Wash Black Lace.

Laces are so much worn at present that a reliable method of washing black lace is likely to be of service. Directions for washing white lace are so often given that one is not likely to fail in that. Put your lace to soak in water enough to cover it, to which you have added two teaspoonfuls of borax to every half pint of water and the same quantity of spirits of wine. Rinse the lace through this several times, and rinse again in clear water. Soft water is preferable. Meantime boil a black kid glove—a glace kid and not a Suède—in a pint of water until it is reduced one-half. Rinse the lace through this and squeeze it as dry as possible. This will give it just the slight stiffness desirable. Take a hard board, with a cloth tacked smoothly over it; spread the lace on this, stretching the pattern out nicely, spread a second cloth over, then another board, and weights. Leave it in this press for two days. If carefully renovated by this process even rusty black lace looks fresh and new.

A Japanese Sachet-Bag.

SUSIE C. STANDISH.

The accompanying illustration needs but little explanation. The Japanese doll is dressed in ribbon, although silk and satin can be used instead Two pieces folded over the shoulders and crossed in front and back form the waist. Catch the edges

A PRETTY ORNAMENT.

together on the underside of the arm for the sleeve. The skirt is made of four bags of the ribbon, which is two and a half inches wide and twelve inches long before made. After sewing and turning the bags fringe out an inch at the top, then fill with cotton batting, with a liberal sprinkling of sachet powder, gather and sew the bags around the doll's waist, fold a piece of ribbon for a belt, and it is ready for the toilet table.

A Pretty Needle-Book.

Make a needle-book in the old-fashioned method, covering the pasteboard covers with bright wool or silken stuff; fill in the pinked flannel leaves and then, to make a rich and handsome affair, pretty enough for a present to the most dainty, put on an ornamental finish by crocheting small brass rings (those half an inch in diameter are the prettiest size) full of black embroidery silk, and joining the rings with needle and thread. Fasten them on both covers. The rectangle made by placing the rings side by side should be a little less in size than the book. By getting the rings first and forming the figure, one can make the size of the book to conform.

An Easily-Made Knife-Box.

L. E. ELLIS, SOUTH AFRICA.

An ordinary paraffine tin, a piece of board, and a few tools will suffice for the making of this box. Cut the tin lengthwise in half and use one-half. Turn down the edge around the top to avoid

FIG. 1. SHAPE OF BOARD FOR PARTITION.

sharpness, and when this is done the tin will be about four inches deep. For the division of the box use a piece of six-inch board, cut of such a length that it will fit into the tin lengthwise. Cut this board off at the corners in the places shown by the dotted lines in Fig. 1, and also cut out a triangular

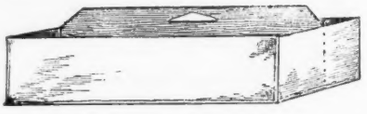


FIG. 2. COMPLETED BOX.

piece, as illustrated, to form a handle. Slip the piece of board into the tin lengthwise and upright, and fasten it by driving nails through the tin and into the ends of the wood, and also underneath. Finish by giving it a coat of enamel, and you will have a strong, durable, and convenient knife-box, as shown in Fig. 2.

Homemade Furniture.

It is so possible for even an amateur to make presentable, useful, and even pretty articles of furniture that some directions for finishing and polishing may not be amiss. For a first coat (a "filling" as it is called) there is nothing equal to raw oil. If the article is made of any hard wood one coat will be sufficient; if of pine two or three may be desirable. Simply apply with a brush and let it dry; repeat if necessary, and then sandpaper until smooth. For any soft wood, finish with a coat of varnish such as any painter can supply you with; but if you have been more ambitious, and made your desk, or cabinet, or what-not of hard wood, you must use beeswax and turpentine if you would have a really beautiful polish that will grow brighter as the years go by. Melt the beeswax with a little turpentine, apply with a flannel rag, rub in with a soft brush—an old nail-brush is good—and finish the polishing with old flannel. This means labor, but it pays, and gives a brilliant polish quite different from the shiny surface of a varnished article.

Fireplace Screens.

DOROTHY PENN.

In the country house, especially, a little taste will make a small amount go a great way; and a piece of red matting painted with daisies, or water plants, or wild roses, is a pretty fireplace screen. The ends, of course, are to be carefully bound. If there should be no artist in the family pretty floral designs from wallpaper, neatly cut out and pasted on, will be found quite effective.

For the impecunious person who has no capital, perhaps, except some old Japanese fans that seem indigenous to almost every house, there is another device. Let her get a piece of very thin board, or stout pasteboard, cut of a size that will just fit in over every trace of where the fire or the stove has been, then cover it with cambric, muslin, or with Turkey-twill. The stock of gay fans must then be looked over, and the torn ones carefully mended by bringing the edges together and pasting thin paper underneath, boldly substituting a flower or bit of color taken from something else where a piece has been torn out, and touching up generally with a little paint and gilding should they be at hand; then fasten to the red-covered board with small nails, lapping one fan over the other, and placing the prettiest ones in the middle. The result will be really handsome and unique on a very small expenditure of either money or time.

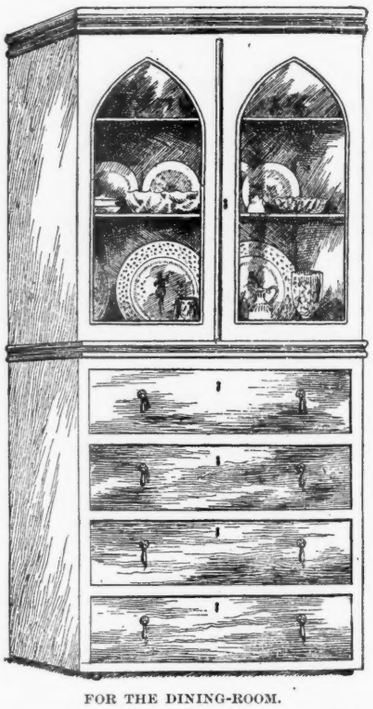
Another screen may be made of a kind of crazy patchwork with considerable method in its madness. The idea is to imitate stained glass; and on a foundation of strong unbleached sheeting a vase or bowl holding a blossoming plant should first be traced — a lily, rose, or sunflower being best adapted to the purpose—and the outlined spaces are then to be covered with bits of silk of the right colors carefully stitched down, and the stalks worked in stemstitch. The ground can be filled in with mosaic bits of silk, and the piece then mounted on a board. If neatly and tastefully done this screen is quite an elegant affair.

To many the prettiest screen of all is a long, narrow box, with ivy growing on lattice-work at the back and wild ferns from the woods in front. This box, a common wooden one, can be made quite ornamental by painting it vermilion and then pasting on wallpaper in a pretty tile pattern, first cutting the tiles apart and placing them so that a little strip of vermilion shows between as well as at top and bottom. Arranged in this way light blue or salmon-colored tiles are very pretty.

A Homemade Sideboard.

CLIFTON S. WADY.

In hundreds of rural homes throughout the country may be found, long neglected and removed to store-room or attic, the piece of furniture styled "an old-fashioned bureau," the dimensions of which are about three feet long by three feet high and twenty inches front to back, four drawers being provided. In these days of restoration of all things ancient, a description of any



FOR THE DINING-ROOM.

newly-applied ideas in this direction will be of interest to the reader. Such a piece of furniture as is here referred to has been draped and mounted with mirrors, and the process has been "written to death" in the periodicals. Circumstances led me to utilize one of my own, however, in an entirely new way, as I believe. When a library was set up in our house, one of the results was to leave an empty case of shelves on our hands. As it was furnished with glass doors and of a proper size for the purpose, it occurred to me to combine these two pieces into a sideboard, thus transforming the useless and humble objects into one which should

be a source of pleasure to the eye and of daily utility. The illustration represents the resulting combination. The glass panels in the doors are square pieces of glass, the point being cut in the wood framing, only. It will be observed that the old round wood knobs have been replaced by modern metal drawer-pulls on the bureau; this was the only alteration made. When the top was put in place a thin strip of narrow molding was tacked around the base and the whole side-board was then refinished. A painter might come in and do this at moderate cost and stain the parts to match, if necessary.

Concerning Hospitality.

There is very little of the old-time hospitality at the present day, unless we except people who live in the country and on farms, who are generally more hospitable than city people think it possible to be. The high rents of city apartments and houses, the small size and scarcity of the rooms, have a great deal to do with this. Where families of six are living in flats of seven or eight rooms, having company, no matter how fond one may be of entertaining, becomes a difficult matter which it takes a big heart and a deal of planning to compass. Now, since so many of us who live in the city are debarred from receiving our friends, let us have some pity on the friends whom we visit in their country home and remember that even in the country they do not entertain guests except at the expense of much labor and outlay of energies.

It is possible to make one's self a welcome visitor, but to do this requires a degree of unselfishness and adaptability that some of us do not possess. If you are visiting where there is an insufficiency of servants, or where none at all are kept, good taste requires that you should make as little extra work and trouble as possible. Care for your own room. By no means let any of your soiled linen go into the family wash. In a quiet, unobtrusive way perform little helpful tasks for your hostess so that your presence shall be a delight instead of a burden. You can lay the table, dust the parlor, help with the weekly darning and mending. You can even send her off for a day's outing with her husband while you take her place in the house. If you cannot, or are unwilling to do this, then never visit a country friend who has no servant. As a child I used to feel outraged at the coolness with which my delicate mother was allowed and expected to work for and entertain city friends who never by any chance expressed a wish for a return visit. The work of entertaining falls much more heavily on the wife than on the husband, and a man who is naturally hospitable will often permit his wife to receive more visitors than she is able to care for without overworking herself. If you find that your friend is doing this, though her welcome be never so earnest, shorten your visit.

We, who are visited, have our duties also. During the first days of my married life I resolved that I would never entertain any one from compulsion, or because they expected it. All my life we had received visitors who had no claim of relationship, scarcely of acquaintanceship, on us, merely because they liked to have a place to visit in the country where there was plenty of fruit and where horses and carriages were kept. Some of these people were often the greatest annoyance to us, and yet they were endured because it would be "so inhospitable" to show them that they were unwelcome.

It is dishonest to invite any one who is not heartily welcome, and it is equally dishonest to try to keep up a show of welcome that you do not feel. But, having once decided that a visit from our friend will be of mutual benefit and pleasure let us take him into our family as one of ourselves. Do not let us add to the cost or trouble of daily living to such an extent that he will feel himself to be a burden. This will be neither for his happiness nor for yours. On the other hand, having invited him, we are bound to make some little concessions to his comfort and enjoyment. A lady once pressed a friend and his wife to come and make her an extended visit. She would take no denial. They were to come and make themselves "exactly at home." The invited guest was a confirmed dyspeptic, which the lady knew before asking him to pay her a visit, and yet, on the first morning they came down to a breakfast of fried mackerel. Naturally he ate none, at which she expressed great surprise. The next morning there was fried mackerel, the next fried ham, and so changes were run on ham and mackerel through the visit, which lasted only until some plausible excuse could be found for shortening their stay. This is making your friend "at home" with a vengeance. We should either not invite a guest or we should be able to make some little concessions for his comfort. The courtesy of finding out his likes and dislikes in regard to food and the temperature of his room is one which we should willingly pay. An invited guest should not be asked to conform to an unreasonably early breakfast hour, while he should be left perfectly free to dine with the family if he preferred. The true and ideal host is one who can entertain her guest and yet give him the idea that both his movements and her own are perfectly free and unrestrained.

How to Riddle Ashes Without Dust.

TOM MERRY.

I have a little tale to tell, how a man can be merry over ashes; yea, even when he has them to sift. I have been grinning over the dust from ashes for the past seventeen years, thinking I might find a way out, and now that I have I can smile.

I saw once at the house of a preacher—and they have to do many dusty things—a device for riddling ashes. It was no more or less than a large sieve such as builders use for riddling sand. He had it propped up on a decline, as they do. I said to him: "How do you use that?" He replied: "I take the ashes out of the stove, walk up to it, give them a fling and the thing is done, for they riddle themselves." When I asked: "What do you do when the dust rises?" "Why, sir, like a wise man," said he, "I run up stairs."

He weighed about 250 pounds. His congregation would have smiled to see him running to get away from the dust. He thought I made merry, and wished to know what better way I had. Now it happened that I had a way not much better, only I was on the road to the best method, which I have found out to-night. When I discovered it I asked myself how it could be that I never thought of it before. It is so simple that I wonder no one ever discovered it. I give it out freely; if any one wants to patent it they are welcome to do so, and make all the money they can out of it.

I made a sieve ten years ago that is as good as it ever was. It is that heavy wire used by builders in their riddles, only the meshes are not half so large. You should see my ashes; they are as clean and fine as sand. I take the shovel and toss them, like a bull tossing the earth in the spring of the year, every time I go into the cellar. They never raise any dust, because I wet the little pile at the beginning as I riddled them, and no more. All the dry ashes laid on the pile after that soon absorb enough moisture to keep them damp. Indeed, I had my eyes opened on the dampness of cellars in this same matter. I was down in a church cellar teaching a boy how to sieve ashes with a riddle that I had made him. We put the dry ashes down on the cement floor, and the next morning they were soaking wet. They took that moisture from the atmosphere of the cellar.

But anybody can keep down the dust after they are sifted—the dust of sifting is the troublesome part. Let me tell you how it can be done. I got a piece of hemlock 3x4 and made a frame about three feet long by about two wide, and put on it the heavy wire noted above. There you have something too heavy to pick up, and so you ought. You do not want to be soiling your hands with ashes. I purchased an old dry goods box and threw the sieve across one end of it. I fastened a cleat on the sieve to keep it in its place. The box is much longer than the riddle is wide, so I covered the open end of the box with a board, and on it, alongside of the riddle, I placed a little basket to hold the cinders. Indeed, I do not care much about picking out these cinders. I throw everything back into a good fire. These cinders and white stones or pieces of slate will stand a good deal of burning. But how to keep down the dust—there was the rub. I sometimes poured water on them as I threw them into the riddle; that seemed rather slow, and when I worked them over with a light little shovel used by lime burners the dust would arise. To-night as I thought and worked I looked on the pile of damp ashes and said to myself, "How would a shovel full of those ashes put on these light ones work?" I took out of the heater as dry and light ashes as any man will get after shaking down the fire, and gently laid them on the sieve. Then I picked up a shovel full of those damp ashes, already sieved, and laid them on top. Then, with the point of the shovel as before, I worked them over, lo! not a particle of dust arose. The damp ashes caught up every flying particle as it attempted to rise, and before it took wings on the air carried it down below, and the work was done. I can now riddle ashes over that sieve with broadcloth on, and not a fear of dust. I have conquered.

Autumnal Styles.

"We girls are all going to wear gray dresses, to-morrow," announced a vivacious young lady, one Saturday morning recently, at a well-known seaside resort. It was a girlish freak but the fact that a score of maidens—more or less—summering at a fashionable hotel could thus draw upon their wardrobes and unite on a common color shows the immense popularity of the soft, ladylike tint, several shades of which manufacturers declare will remain as a leading style throughout the coming season.

"But gray makes some of us look like frights," Miss Sallow Blonde may pout.

Not at all, my dear, if you only know how to trim it. Pure and simple, or combined with steel or hard black, it is trying I admit, except to those fair-complexioned, brown-haired lassies who can wear anything, but just add a collar and plastron of some becoming silk or chiffon and note the difference. Why, the darkest brunette may adopt the Quaker hue and look charming in it, if she but relieve its coldness with a touch of old rose, rich cardinal red, or glowing yellow,—while, by the way, this last combination is considered particularly stylish and effective. Gray hats may be rather more difficult to manage but with a dark, rich velvet facing, they, too, can be transformed into a "thing of beauty" and becomingness, and a joy for one season at least.

Rough surfaced grays, too, are not so trying as smooth fabrics, and these recall the very *chic* blankety cloths lately imported, brightened by stripes of *faille* silk, which New York women, who have the wherewithal, will delight to possess at the first equinoctial blast. They are new, stylish, and very expensive, but a standby for all winter.

A trim little suit, also, for those who are to spend the autumn in the country, is formed of golden-brown corduroy and brown China silk; the velvety, wide-ribbed goods being fashioned into a plain skirt and blazer jacket, with which is worn a blouse waist of the silk and a "fetching" brown-felt sailor hat, trimmed with russet-hued ribbon and just one stiff quill feather of glowing red.

For all fall suits the indications are that the bell skirt, with bias seam up the back, will remain in vogue and jacket corsages will largely prevail. In fact, perfectly plain, high basques are rarely seen, except on elderly ladies. This combination jacket and corsage will generally have loose fronts opening on a contrasting blouse, or else a silk or velvet vest. The Medici collar—so becoming to those with long, slender necks—appears again, finished by a knotted cravat of the same material as the waistcoat. The short little Breton jacket too is worn, with a very long, square-cornered, much-bedecked vest, those who delight in unity of design having this last of white cloth, embroidered in yellow, black, and red, the true local Breton colors.

Silk seems to be superseding velvet as a combination fabric for woolens, and will probably continue so until midwinter. Handsome fleece-lined coats of Jersey cloth have full silk sleeves, wide bindings, and silken buttons.

Other jaunty fall jackets of three-quarter length are much liked of dark blue cloth, made with hip-seams, and a double-breasted front. They are stylish trimmed with black braid, but very smart young women make them gay with linings of golden-yellow serge and gilt buttons. If intended for very cold weather, an interlining may be added of lamb's wool, which comes in small squares, and is tacked here and there, forming the lightest, most delightful wadding imaginable.

And now just a few words about lingerie. Passing by the luxurious silk and not particularly healthy linen underwear, we find the daintiest white garments are fashioned of soft French nainsook, the next choice being percale or slightly heavier undressed cambric, while the favorite trimmings are simple embroidery done on the fabric, strong, plain laces which show the merest scallop or wee

petit pois dots, and narrow ribbons run through openwork insertions. All undergarments are more-closely fitted to the figure than formerly, even nightdresses being sometimes belted or sloped to the waist. This is a fad, however, which will hardly be universal. The *robe de nuit* is generally cut rather low at the throat, with a wide turned-over collar, hemstitched ruffle, or fall of lace. The sleeves are large and full and gathered into deep cuffs, while young girls set small bows of pale blue ribbon on the wrists and at the neck.

French garments are made without belts, the tops of skirts and of drawers being faced or hemmed an inch deep, through which a drawing-string is passed to arrange the fullness around the waist. The chemise is a decidedly *passé* article of apparel, but for those who still cling to it I would say it is now more a combination of the corset-cover and short under-petticoat than the loose, clumsy garment which one girl of my acquaintance declares is a "relic of barbarism." This "Marguerite" chemise, as it is termed, has a low, round neck edged with a double ruffle of lace, no sleeves, and is shaped in the back by three box-plaits, the front being gathered into a belt of inch-wide beading, through which a ribbon is threaded in and out. Somewhat simpler are the sack shapes fitted by darts.

Low-necked corset-covers are made just like "baby waists" shirred to a deep belt set on as a facing and extending over the hips. High cambric covers have lengthwise plaits, confining the fullness about the waist or else are tucked back and front, and trimmed with a yoke of needlework.

Colored petticoats of silk Chambéry or mohair are mostly worn on the street, but white muslin ones are often used in the house, and these are liked of French percale laundered entirely without starch; that there may be no rustling whatever. They are made two yards and a quarter wide at the foot, and very much gored at the top, where they are adjusted to the figure by drawing-strings. The decoration consists of a cluster of tucks and row of insertion above a deep hem, or else two scant ruffles of embroidery.

Transfer Work.

DOROTHY PENN.

Transfer work is pretty in many ways if well done, but few seem to know what lovely curtains can be made with it. Cheesecloth in its natural color makes a good foundation; but a thin quality of unbleached muslin is more durable. Either material falls into soft folds, and is a desirable background. The designs, flowers and figures, according to taste, are cut from cretonne and loosely buttonholed on the foundation. The effect is rich and novel, but the labor is considerable, and a certain set of curtains that are much admired are managed differently. The foundation is of Bolton sheeting, which is of a lovely rich cream color, and the red, pink, and tea roses, with their buds and beautiful sprays of leaves, are cut from sateen of a pale pink ground, badly faded with a season or two of use. But the roses and leaves look fresh, and they are carefully cut out and lightly pasted on the sheeting. The effect is that of painting, and the curtains are really charming. Pretty table-covers and scarfs are made in the same way, and a small round table has a square cover of pale blue sateen on which a border of apple blossoms is loosely caught down. One in dull red has dogwood and ferns, and handsome sofa cushions are made by outlining large flowers with fine gold braid. A medium-sized mirror with a common wooden frame or a plain and shabby gilt one can be made ornamental by covering the frame with any colored material that will take embroidery or transfer work well. It is better to cut out all four sides together than to join the corners; but if this cannot be done without too great a waste of material they should be joined to show as little as possible. When the work and expense of embroidery must be avoided, gold rings painted on sateen make a very pretty decoration.

A Crust of Bread.

DR. A. S. HEATH.

The commendation of a crust of bread by our parents if not founded on knowledge was sound in science. The outside of the loaf in baking is heated much more than the inner part and, being dried more, the starch is converted into dextrine and sugar, and in greater and long-continued heat caramel (burnt sugar) is formed, imparting that peculiar sweet and burnt taste to the crust. The brushing the hot loaf over with water gives it a peculiar gloss. The sweet taste is due to the conversion of a portion of the starch into sugar. This predigested bread is well adapted to dyspeptics and, better, the prevention of dyspepsia. That it makes the cheeks red, as our parents asserted, is a physiological fact.. It is the true *rouge* of genuine health, and reaches deep down into the very foundation of a sound constitution. Wisdom is not all of modern growth.

Kitchen Notes.

K. B. JOHNSON.

The dampness and unwholesomeness of an undersink cupboard, such as one finds in nearly all old-style kitchens, can be remedied by boring numerous holes in the front and end with an inch auger and by keeping a can filled with unslaked lime on a shelf inside. The holes can be made in a geometrical design and detract in no way from its looks.

If a sink reaches to a corner of the room a bracket shelf fastened at a convenient height in the corner is handy for holding those numerous time- and strength-saving materials which the wise worker provides herself; namely, sapolio, pearline, borax, and a vegetable brush. If room is wanting, screw-hooks can be put in the underside of the shelf to hold the wire dishcloth, soap-shaker, etc.

Shades and spring-rollers are too cheap not to be found in every kitchen. And if they are placed four inches below the window-casing good ventilation can be secured and the windows darkened at the same time. Any woman who can use a hammer and screw-driver can easily adjust them. It is scarcely less difficult to put up a shelf with the iron brackets which can be purchased for a trifling sum at any hardware store, and one back of the stove will save untold steps.

If the range stands near a corner of the room have two slats fastened across the corner, three or four feet apart, for holding dish towels in rainy weather (for they should always be hung in the sun when it shines), stove-cloths, and the like.

If the kitchen table has no casters buy a set and put them on. It is not a difficult matter and will save a deal of strength.

Pieces of pasteboard, with holes an inch in diameter by which to hang them on a convenient hook, are excellent for placing under hot cooking dishes. Or, lacking this, old wrapping- and newspapers answer every purpose.

A twine bag, with a pair of shears hanging conveniently near, should be found in every kitchen. So, too, should a pincushion and small mirror. One can easily find time to give a becoming touch to their toilet before going to the dining-table that would not be given if compelled to go to one's chamber or the bathroom.

Many vegetables are better for not having the skin cut before being cooked. For this reason, as well as ease in cleansing, a vegetable brush is a necessity.

Not only have a high stool which permits of your sitting to do many kinds of work, but an easy rocker in which you can do many others, or can rest in an occasional odd moment.

A rug under one's feet is restful when long standing is necessary, as in ironing, or in washing dishes.

Put a little pearline in the greasy pots and roasting-pans, and it will greatly facilitate cleaning them; especially if you stand them on the range to heat the water.

A large earthen bowl should always be used for stirring cake in.

Clocks are too cheap for the tired housewife to spend her time and strength in running from the kitchen to some other room to consult one.

Home Recipes.

Stewed Turnips with Gravy.—Pare some new turnips, cut in quarters and cook until tender in salted boiling water. Drain and place in a stew-pan with a tablespoonful of butter; shake until turning yellow, add a cupful of good gravy; simmer five minutes, season and serve.

Pear Pies.—The late pears that do not ripen until they have been picked for some time make nice pies. Line a dish with rich crust and fill with sliced pears, dotted with butter, and sprinkled with sugar to sweeten and cinnamon to flavor. Cover with a top crust and bake. When done raise the crust and pour in a couple of tablespoonfuls of sweetened cream.

China Chilo.—This is an excellent dish with a curious name. Mince fine a pint bowl of uncooked mutton with two ounces of fat salt pork. Put three ounces of butter into a saucepan with two small onions minced small, three young lettuces, if they are in season (if not a cup of minced celery), salt, pepper, parsley and a pint of green peas. Stir over a gentle fire for ten minutes, add the meat and enough stock or water to cover. Stir thoroughly, cover the saucepan and simmer very slowly for two hours. If peas are not in season add canned peas half an hour before the dish is done. Serve with steamed rice. It must be moist, but not too thin and soup-like.

Chicken Cutlets. — When the white meat of chickens has been used for salads or for some company dish, the legs will make a delightful dish of cutlets. Separate the first and second joints and simmer until tender in water flavored with soup vegetables. Put the joints in press between two flat dishes with a weight on top, and when cold trim them neatly into the shape of cutlets. Dip in egg and bread crumbs and fry a golden brown. A really handsome dish may be made of these by placing balls of mashed and fried potatoes, cauliflower boiled and broken into florets or canned peas in the center, the cutlets around and a cream sauce poured over all.

Scrappel.—A subscriber from Pennsylvania furnishes the following recipe for making scrappel: Boil head, liver, and the trimmings from ham and shoulders, and shins from pieces intended for lard until easily separated from the bone, and then put through the sausage-cutter. Into the liquor in which the meat was boiled, all the small bones being strained out, stir in equal quantities of Indian and buckwheat meal, sufficient to make mush, into which stir the chopped meat, with seasoning of salt, pepper and sage. Allow the whole mixture to cook a few minutes, stirring it constantly. Pour it into vessels to cool. Being more thoroughly cooked than by the usual way it keeps better. To serve it, slice and fry.

Scalloped Fish. — This can be made from any flaky fish, cod being the cheapest. Put over the fire in cold, salted water and boil, allowing eight minutes to the pound; drain, break the fish apart with a fork, and mix with a cream sauce, allowing half a pint for each pound of fish. The sauce is made by mixing one tablespoonful of butter over the fire with one of flour, and then adding half a pint of boiling milk; season with salt and pepper. Stir the fish and cream together lightly with a fork, seasoning to taste with salt and pepper, and just a "suspicion" of mace! Put into scallop shells, which your fish merchant will give you, dust thickly with bread crumbs, and bake fifteen minutes. Minced parsley may be mixed with the sauce if liked.

Fried Chicken with Oysters. — Joint a tender chicken, season rather highly; sprinkle over very finely minced parsley and onion, a little table oil and a teaspoonful of lemon juice; let them lie in this marinade, turning every now and then for several hours; then dip in flour and fry until brown and tender. Lay out the pieces as fast as done, keeping hot in a covered earthen dish. When all are cooked, if there is more than a tablespoonful of fat in the pan turn the rest out, add a large tablespoonful of butter, a gill of hot cream and a pint of thoroughly drained oysters. Season lightly with salt and pepper, and as soon as the beards of the oysters begin to open, by which time the gravy will have thickened slightly, pour all over the fried chicken. In frying the chicken care must be taken that there are no burnt particles left in the pan, as this would spoil the delicious flavor of the oysters and cream sauce.

Uncle Barlow's Return.

WILLIAM PERRY BROWN.

When Nanna went to the spring for water she carried her Pilgrim's Progress in one hand. It was an old dog-eared copy, which she read stealthily at intervals, when Aunt Seliny was otherwise engaged. After filling her bucket she sat down upon a rock and opened the book just to see how poor Christian would fare up the hill of difficulty with that great burden upon his back. There was a picture at that point where he looked so weary and dejected that Nanna felt sorry for him.

Then she heard steps and, looking up, saw a man so much like Christian, except in age, that she felt startled. Instead of a bundle, a shabby black carpet bag was swung upon a stick over his shoulder. He wore coarse brogan shoes and battered wool hat. His weather beaten face looked shrewd but kindly and his eyes were small and sharp.

"Little girl," said he, "Can you tell me where Joe Emmons lives?"

Nanna, seeing that this could not be Christian after all, took up her bucket.

"Up the holler yonder," she replied. "I'm going there. Won't you have a drink?"

She handed him a gourd of the cold, clear mountain water. After a long draught, he looked at her approvingly.

"Are you one of Joe Emmons's gals? he asked.

"I'm Aunt Seliny's niece."

"Been lookin' out for any one lately?"

"I—we've been lookin' for Uncle Barlow from California. Uncle Joe says he's master rich."

The man looked at Nanna's bare feet and ragged homespun dress. Then he frowned.

"Rich, eh? Well, I'm Uncle Barlow."

Nanna was so surprised that she set her pail down and stared at the man. Then she felt a sense of pity that he should look so poor and weak and old.

"I'm glad you've come," said she, shyly holding out her hand. "You'll just be in time for dinner."

She led the way and the man followed. A little woolly, mild-looking dog trotted beside them and looked up at Nanna with friendly eyes.

"That your dog, Uncle?"

"Yes, that's Dandy. Had him five years. He ain't much to look at, but he's cute—powerful cute."

Great was the amazement at the house when this trampish-looking old man presented himself behind Nanna, who dared only to say:

"Uncle Barlow's come."

A month ago this far-off relative had written that he was coming to revisit his old home once more. Twenty years had he been in California. Of course he must be rich, they thought. Doubtless he would appear in a carriage, and wear broadcloth and a gold watch, and have his pocket stuffed with bank notes.

"These old miners, when they do get rich, never know when to stop," Mr. Emmons had said, though what he meant was not so clear, except as a loose reference to the generous ways of rich Western uncles when returning to their poor kinsmen in the East.

NANNA AT THE SPRING.

But one glance at Uncle Barlow crushed all their golden hopes. Nanna dragged out a chair and he sat down. Mary, the oldest child rose and put away a pair of socks she was knitting. If Uncle Barlow was really so poor, perhaps he had better provide his own socks. Joe—aged sixteen—had arranged with himself a plan by which, through Uncle Barlow's aid, he would buy a young mule, from Captain Lee, their nearest rich neighbor, that he had for some time desired to own. Now, however, Joe glared at Uncle Barlow as if the latter had in some way robbed him of his own.

"Don't seem very glad to see me," said the old man, looking from one to another. "Seliny, hain't you goin' to kiss your own born brother?"

"Well, Barlow," replied Mrs. Emmons, without moving, however, "we didn't look to see you back in this shape."

"Yes—but poor folks has poor ways, Seliny. I'm no exception."

So Uncle Barlow really was poor. Joe thought sadly of the mule, and Mary resolved to send those socks to the country store, while Mr. Emmons, too much chagrined to take his disappointment calmly, said:

"Do you mean to say Barlow, that you've come back from Californy just as poor as you went there?"

"You 'member the crash they had out there last fall?" Uncle Barlow sighed, then looked hungrily at the table, now spread for dinner, "Ah, well! People gets busted out there as well as anywheres. But never mind; I'm 'mongst my kinsfolks now, and—I'm master hungry."

There seemed to be no way but to be civil to Uncle Barlow for the present, so they all had dinner. Mrs. Emmons, however, drove Dandy out of the house.

"Don't be too harsh with the little feller," said Uncle Barlow, mildly.

The old man soon made himself at home in a quiet way that none of them liked, except Nanna, who tried to be kind to him when Aunt Seliny was not looking. He did not talk much, but he saw that the child was regarded only as a drudge for the rest. Uncle Joe usually ignored her; Aunt Seliny scolded her and kept her busy. When Joe wanted a chair he took Nanna's; any duty Mary desired to shirk fell, as a matter of course, upon the younger girl. In her face was a kind of mature sadness,—pitiful to see in one so young—that recalled to Uncle Barlow his dead sister—Nanna's mother—when she bade her brother good-bye twenty years before.

Nanna's usual refuge against trouble was in her Pilgrim's Progress, which Aunt Seliny once threatened to burn, whereat Uncle Barlow frowned, as he looked at the fire. The child, in pity of the seemingly helpless old man, would liken him in her mind to Christian, and one night made the two acquainted by reading to her uncle after the rest had gone to bed.

"Seems like that feller did have a hard time," said Uncle Barlow. "But I'll bet he comes out all right. 'Taint every poor chap that stays poor."

Then he stroked Nanna's hair and blinked at the fire, giving his head a sage nod or two.

One day Uncle Joe came in and said:

"Brother Abe and family are coming over from

Steer Creek to spend Christmas week, and where we'll put em all I don't know, for we're master crowded up here now."

He glanced at Uncle Barlow, who sat smoking with Nanna on his knee and Dandy under his chair. The old man said nothing, but he came down the next morning from his bed in the loft with his satchel in hand.

"What—you ain't going to leave us, Barlow?" asked Aunt Seliny, pretending to be quite surprised.

"Yes, Seliny, I'm goin' to Weston, and I—I'd like to take Nanna along if she'll go."

"Goodness, Barlow! How can you think of such? You're hardly able to take care of yourself."

Aunt Seliny did not like Nanna, yet the child was too useful to be lightly parted with. But Nanna, watching eagerly, now sat down and began to cry.

"Seliny," said Uncle Barlow, energetically, "think better of it. You all don't like her, any more'n you do me. I'll be good to her—for Sister Maria's sake."

"No, no," said Mrs. Emmons, while her husband nodded approval, "I'd ask you to stay longer too, but,—you see how we're fixed."

Uncle Barlow had seen only too well. He bade them goodby and shuffled away, closely followed by Dandy. As he passed the spring he shook his head sadly, then he heard a child's voice calling:

"Uncle Barlow! Uncle Barlow!"

Nanna came flying down the path, holding out her treasured Pilgrim's Progress.

"It'll be some comp'ny for you," she said. "I'm so sorry you're goin' off—alone."

Uncle Barlow's eyes grew dim. He bent down and kissed her, a thing he had never done before.

"You keep it, honey. My old eyes couldn't see to read it, you know."

A rumbling of wheels was heard, then a great wagon came in sight upon the "big" road that led to Weston.

"There's Jim Dunlap," said Uncle Barlow, waving his hat to the driver. "He'll let me ride."

Nanna glanced hurriedly toward the house and, seeing no one, held out her little arms.

"Take me, Uncle Barlow," she cried. "No one is good to me but you—take me along."

The old man drew back, then he appeared to reflect. His dead sister seemed to be looking at him from the eyes of her child.

"I'll do it," he said. "Seliny haint got no heart for any one but her own—it'll serve her right. Do ye reely want to go, child?"

Nanna grasped his hand, though still holding to her Pilgrim's Progress.

"Less go," she said. "Mebbe they'll miss us afore we get off."

Uncle Barlow laughed.

"Hit's my opinion you never made a wiser choice," said he. "But see there. Jim's a-gettin' in a hurry."

Two minutes later Uncle Barlow, Nanna and Dandy were safely ensconced beneath the cover of the great wagon as it creaked and rumbled along the Weston road.

A week or so later on a yoke of oxen were halted before a certain lawyer's office in Weston. From the rickety wagon attached Joe Emmons sprang down and went inside, leaving his wife to mind the steers. The lawyer looked up from his papers as the farmer entered.

"Well," said he, "have you raised the money, or have you brought back the cattle?"

"I havn't raised the money," said Joe. "Times is hard."

"I'm sorry; but your note has passed out of our hands. Here is the address of the party who bought it up, and you will have to arrange matters with him."

The lawyer gave Mr. Emmons a card and at once resumed his work, while Joe, much perplexed, drove off to see his new creditor. The address led them to a neat cottage villa, with a trim garden before, and a general air of ease and comfort all about. The door was opened by a little girl at whom Mr. and Mrs. Emmons stared aghast. A new and stylish frock, a jaunty hat and feather, long black stockings, buttoned shoes—surely, the fairies must have transformed their whilom little household drudge.

"Law me—if it aint Nannie!" exclaimed Aunt Seliny.

"What does this mean?" demanded Joe severely. He was angered over this sudden transfer of a debt that had worried him a good deal, to—goodness knew who! "I'll learn you to run off 'thout sayin' what nor who to nobody."

While Joe was speaking, Nanna had timidly ushered them into a finely furnished parlor, where they beheld Uncle Barlow, dressed like a gentleman, and seated in an easy chair. In his hand was a slip of paper, and his small, sharp eyes twinkled shrewdly. Mr. and Mrs. Emmons stared again. Was the old man really rich? Had they, in their selfishness, made fools of themselves, after all?

"Sit down, Joe—Seliny," said Uncle Barlow. "Glad to see you. What do you think of my new house—just bought it, you know. I've made Nanna housekeeper. Don't suppose you've missed her very much?"

Uncle Joe had seated himself on the edge of a very fine chair, and was looking around. Aunt Seliny could only gasp:

"Why, Barlow,—we—didn't know—"

"Of course not. You all took it for granted I had nothin', and acted accordin'—all except Nanna."

He drew the girl to his side and eyed his sister and brother-in-law defiantly.

"I soon saw I wasn't welcome, and that Nanna was having a hard time amongst you. I didn't mean to take her away against your wishes at first, but when she came runnin' to give her poor old uncle the only treasure she had in the world I—I changed my mind. Come now—you'll give her up, I reckon."

"Well—no," said Joe, his covetous instincts at once vaguely aroused, "I don't see how we could."

"You hain't no idee, Barlow," exclaimed Seliny, "what store we all set by that child."

Nanna turned to Uncle Barlow with a frightened look. How could she bear to leave this new existence for the old hard life in the mountains?

"Don't worry, honey," he said gently; then he turned to his sister. "It's true I'm what you'd call rich, Seliny, yet I came to you as a poor man to see if my kinfolks would care for something else about me besides my money. Thank the Lord—one of 'em did!"

He patted Nanna's head; then Uncle Joe began to bluster.

"We've raised her," he said, "and we've spent money on her, and how are we to get it back onless she works it out?"

"See here," said Uncle Barlow, holding out the slip of paper. "Do you see this? Well, before I came out, I heard you were in debt, and I bought up that note intendin' to make you a present of it, if you showed any signs of carin' for a poor old man. You didn't, and so I fetched it away. It holds you for two hundred dollars and your cattle are good for it all."

Mr. Emmons cast one despairing glance at his wife. Uncle Barlow regarded them with a grim smile upon his face.

"However," he continued, "I don't want to be too severe. You've showed your hands, but I bear no hard feelins'." Then he turned to Nanna. "Child," said he, very gently, "there's your Aunt Seliny and here's me. Now—don't forget that you're free to make your own choice. Which one on us will you take?"

For a reply Nanna flung her arms about Uncle Barlow's neck who, thus embraced, held out the note once more.

"That settles it," said he. "Here, Joe, take it and burn it up. I've got value received and the biggest kind of intruss right here."

Mr. and Mrs. Emmons, having no other choice, accepted the situation and staid to help eat the finest dinner they had ever seen. When they left Uncle Barlow and Nanna watched them from the front piazza.

"I'm sorry for 'em," said she, hugging Uncle Barlow's arm. "They've lost so much."

"To be sure," returned he, with a sly twinkle in his eye. "They've sold a little gal for two hundred dollars as is wuth thousands. But then, we needn't cry, I reckon—they swindled theirselves."

Chinese Spirits.

LUCY ELLIOT KEELER.

"The moment the pirate boat went down," writes Douglas Frazer, in his last book of adventures for boys, "the two remaining junks turned their attention to us, for it is against the tenets of the Chinese religion to assist any one who is drowning. It is meddling with the designs of Providence. 'Joss put him in; let Joss get him out.' So they were coolly left to their fate."

To one who knows how many precious lives are saved by our life-saving service, this Chinese superstition seems very sad. Great rivers and canals abound in China, and many hundreds of the natives drown yearly who might just as well be saved. If a boat with persons in it should overturn in the water nobody would go out to offer help. They would not dare to. They say, "There is an evil spirit right there pulling the people in." If the unfortunates drown, a big stone is put in there as a warning to others to keep away.

The Chinese are more afraid of spirits than of anything else. They get very angry sometimes at the foreigners. They say that they cut paper dolls and slip them under the doors and through the cracks of the Chinese houses; and the dolls are spirits, and grow and grow until they crush everybody in the house. One man who was cutting paper dolls to amuse a little girl was instantly killed by them. They are so excitable that such absurd ideas spread like fire, and mobs collect on the smallest provocation.

About twenty years ago there was a great revolution in Soochou, and strange as it may seem it was started by a man who got his ideas from the Bible. He collected a great army and started off to overthrow idolatry. Many, many idols were destroyed, but the leader lost control of his army, which began to pillage and massacre. It was like the Reign of Terror in France. The English and Americans finally had to assist the people against the insurrectionists. Before this Soochau had a million of people: now there are only half as many.

Progression cannot go on as rapidly in China as in Japan. The people are not so ready for it. The young Emperor, however, is getting old enough to be restless. He wishes to visit America, and is writing about it to his minister in Washington. The minister is trying to dissuade him, because he thinks the Emperor would afterward try to civilize China at once, and that would bring about a revolution. The Emperor is almost a prisoner now. Pekin has three walls. Inside the first dwell the common people; inside the second the rich; inside the third the Emperor. If any Chinaman should get in there he would be killed at once. "Would a foreigner?" you ask. Well, I think not; they are afraid of foreigners; but I should not like to try.

Bon Voyage!

AGNES CARR SAGE.

"Oh, how I wish I could step right upon one of those big boats and sail away, 'strange countries for to see,'" sighed little Polly Bergen for perhaps the hundredth time, as she watched an imposing European steamer plying its way through the Narrows; for the fertile Long Island farm where she lived bordered directly on our beautiful New York bay, and all summer the blue water was gay with crafts of every size and description, while the incoming and outgoing vessels were a never-ceasing source of interest and delight to the three sturdy boys who ran riot over field and meadow, as well as to Polly, the only girl and daughter in the Bergen home.

"Ho, ho! You would look pretty boarding the Etruria or the City of Rome in that old pink sunbonnet," snickered Christopher, who had an eye for uniformity.

"But I would wear my Sunday hat with the long feather," began Polly, only she was cut short by roly-poly Ted, who was suddenly struck with a "happy thought," and proceeded to air it on the spot.

"Well, we can't really go to sea," he said, "but we can make believe, and that is next best, you know. The old hay wagon will make a dandy steamer, and Fred can fix it up in style, I am sure. Let us run and ask him."

No sooner suggested than done, and off the trio scampered in search of their eldest brother, whose ready imagination and knack of doing things made him a veritable genius in their eyes. They found him in the barnyard, feeding a brood of wee, downy chicks that were his special property; but he was as ready as any of them for the new play, and soon put numerous nautical touches to the ancient cart. A rusty stove-pipe, rescued from the ash-heap, formed a famous smoke-stack, while a block of wood served as a windlass. The stars and stripes floated from the stern, and when Chris pulled the cord attached to the dinner bell Polly

stepped on board, tenderly carrying her black and white kitten, and feeling as though actually *en route* for the Fatherland.

But at that instant there came a diversion in the shape of Baby Ben, who trotted down from the house as fast as his small, plump legs would bear him, at the same time lifting up his voice and piping: "Benny do too! Benny want a ride in a steamboat!"

"Oh, no, no," exclaimed his sister; "Benny Boy would fall off and be hurt, and then what would the mother say? He can't come up here."

"Ess, ess! Benny will! Pollywog a naughty dirl!" sputtered the tiny urchin, stamping his fat foot and growing very red in the face and very tearful about the eyes; while in another moment there would have been a deafening roar, followed by an outburst of sobs and wails, had it not been for good-natured Fred, who was the imperious youngster's devoted slave.

"There, there, little man," he cried; "shut your mouth and you shall go as fast as any of us. If you can't sit on deck you can ride in the lifeboat and be towed along like a king. See now what I will fix for you," and to the youngest Bergen's extreme delight he quickly found himself snugly stowed in a soap-box and laughing as gaily as the others at Fred's comical appearance; for, after a short excursion to the barn, that youth surprised them all by running up the gang-plank and jumping aboard with Grandpa's old discarded beaver crowning his curly pate and Grandpa's antique carpet-bag in one hand.

"Hullo, Innocent abroad!" shouted Teddy; while Christopher quoted:

"'The boy stood on the burning deck,
With his baggage checked for Troy.
One of the few immortal names—
His name was Pat Maloy!'"

Our illustration shows the jolly little tourists just as the bell sounds the signal for departure and they break forth in the familiar old college song:

"'Merrily we roll along, roll along, roll along!
Merrily we roll along, o'er the deep blue sea!'"

while they float away on the ocean of Fancy to the enchanting land of Makebelieve.

And oh, what a wonderful, wonderful country that is! A country that comes and goes like a mirage, but where everything is possible. A country of rare delight which lies all around us but which, alas! so few of us ever see after the happy years of childhood are past! The Land of Makebelieve is emphatically a realm of youth, and as Polly and Teddy, Chris, Fred and Benny sail away, making more knots an hour than the City of Paris ever thought of doing, all things wish them "*Bon Voyage*!" The fruit trees wave it; the long-necked geese hiss it; Mother Hen clucks it; and even the balls of golden down leave their morning meal to peep, "A good voyage and a safe return! A good voyage and a safe return!"

Our Puzzle Column.

For the first five best lists of answers to the following puzzles we will give prizes as follows:

For the first best list a watch, worth $4.00.

For the second best list Stanley's Wonderful Adventures in Africa, worth $2.00.

For the third best list a gold-lined silver-plates cup, worth $1.50.

For the fourth best list an AMERICAN AGRICULTURIST microscope, worth $1.00.

For the fifth best list a mineral cabinet, worth eighty-five cents.

These prizes will be forwarded prepaid to those who send the first five best lists of answers. We do *not* offer prizes for every list sent in, but only for the first five best lists. Answers must be mailed on or before the 20th of this month to "Puzzle Editor," AMERICAN AGRICULTURIST, 52-54 Lafayette Place, New York.

23. WORD SQUARE.

A fish, a musical instrument, another musical instrument, a cart tongue.

24. WORD CHANGING.

Change wheat to flour in seven moves, and then change flour to bread in eight more moves.

25. CHARADE.

My first is a kind of ore, my second is a hint, my third is long delayed, and my whole is to estimate.

26. ANAGRAM.

A proud, idle step. (The answer is one word.)

27. LITERARY RESEARCH.

Who wrote

"O what a tangled web we weave,
When first we practice to deceive!"

ANSWERS TO THE AUGUST PUZZLES.

There are thirty-three allowable characters in the Shakespearian puzzle, No. 17, as follows:

Aaron,	Boyet,	Laertes,
Adonis,	Ceres,	Lion,
Adrian,	Celia,	Nym,
Adriana,	Cato,	Nestor,
Alonzo,	Diana,	Orsino,
Alarbus,	Dorcas,	Oberon,
Antonio,	Dion,	Phrynia,
Antony,	Eros,	Robin,
Bona,	Ford,	Speed,
Bardolph,	Froth,	Slender,
Bianca,	Juno,	Strato.

THE PRIZE WINNERS.

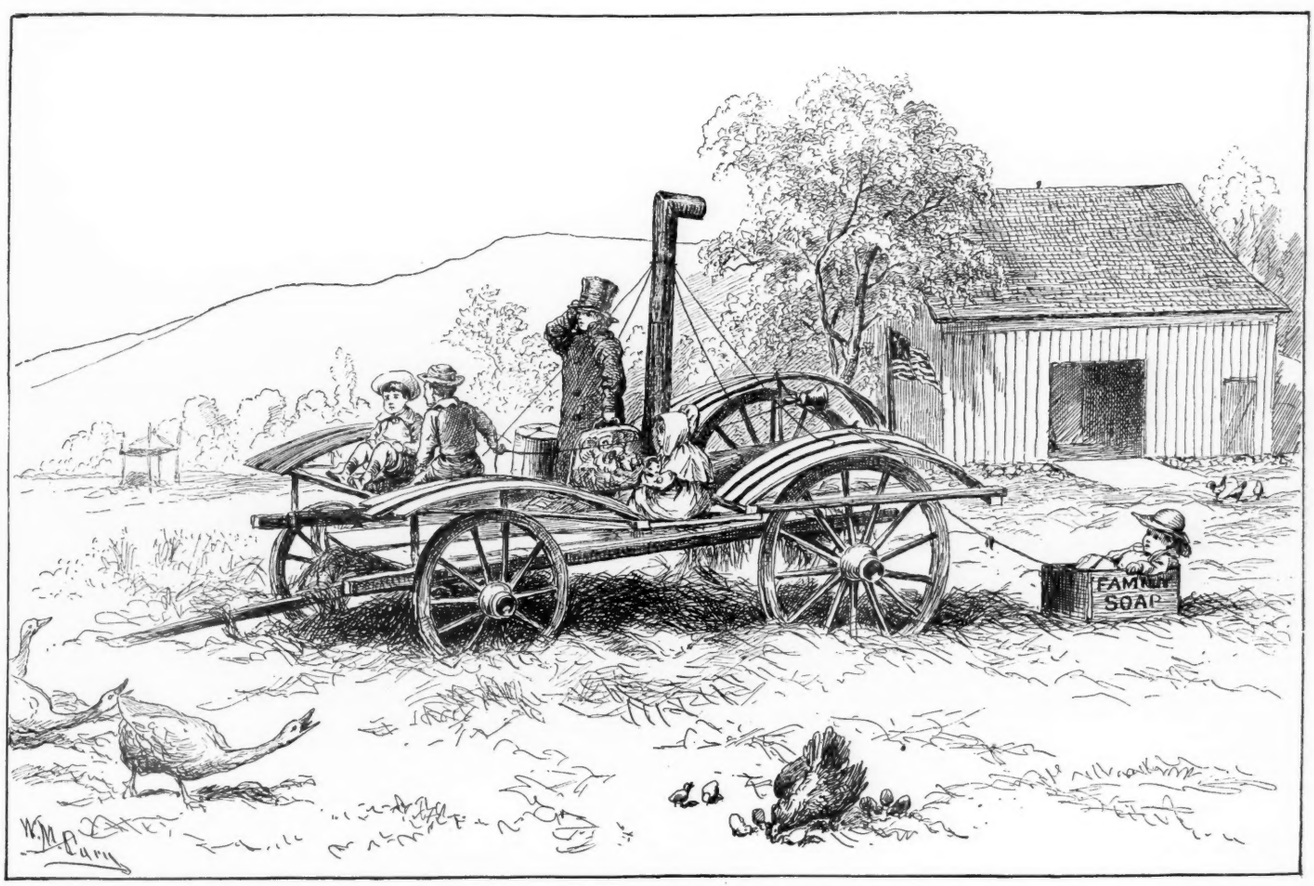
First prize, Daisy D. Layton, Summitville, Iowa.
Second prize, B. Tuzo, New York city.
Third prize, Ella C. Willis, Huntington, Ind.

Fourth prize, Lizette Norman, Egg Harbor city, N. J.

Fifth prize, James E. Greene, Jr., Towson, Md.

There were over a hundred correct answers, but we can, of course, only give prizes to the first five received according to our announcement. It is necessary in competing for the prizes to send answers as early as possible, for the *first* correct list received takes the first prize.

The Shakespeare puzzle in the AMERICAN AGRICULTURIST for August has provoked much comment and amusement. Over 1,000 persons competed. One of them, A. B. Harris, Tennessee, writes: "It was a very entertaining as well as a novel puzzle. My family took much pleasure in working it out. It freshened our knowledge of Shakespeare, and we have had a Shakespearean reading with our neighbors in attendance." One precocious youth of eleven got out the answers without assistance. Doctors and lawyers and other "old folks" tried their hands, but the prizes went to keen-witted young folk! We like to have the comment and suggestions of competitors.



THE JOURNEY OF MAKE-BELIEVE.

Our New Neighbors.

The immigration of Russian Jews into the Connecticut valley is creating considerable comment among the farmers in that locality. A syndicate of sympathizers with these outcasts from Russia has purchased a large tract of land near Hartford upon which a colony will be located, and about one hundred and fifty farms, scattered throughout the valley from the shore of Long Island Sound to a point as far north as Hartford, have been settled upon by Jewish families.

The row that the New England farmer has had to hoe during the past twenty-five years has been a very hard one indeed, and it was only by the hardest labor and the closest attention to the income from his farm and the expense of carrying it on that he has been able to keep his head above water, and the fact that a competitor has been planted almost within the shadow of his humble dwelling, who is only desirous of accumulating money, who is governed by no code of moral ethics; who gives his body and its clothing but an occasional thought; who allows his house, his barn, his shed and his fences to fall into ruin and decay about him, while he sits contentedly on a bench in the shadow of his home munching onion tops and drawing savage consolation through the stem of a monstrous pipe, has the effect of filling the bosom of this frugal laborer with disgust.

As successful tillers of the soil the Russian Jews who live in the Connecticut valley have proven themselves an absolute failure. They have no conception of the science of farming, and they apparently possess no ambition that spurs them forward in the direction of improvement. They are content with planting an acre or two of potatoes, as many acres of onions, a small plat of corn and a few vegetables. Goats take the place of cows with them, and lard is used instead of butter. But very little bread is consumed by them. They eat a great many soda crackers. A barrel of crackers, a quart of salt and a few pounds of lard now and then is about all the patronage that the country grocer can count on from them the year round.

The heavy work of the farm is generally performed by a single horse that is never more than half fed. In plowing a field but little care is taken in turning a furrow. If the top crust is broken the plowman seems to be satisfied. The harrowing is done with a couple of small trees cut down and chained together at the butt. Their fields are never hoed more than once. If weeds spring up thickly among the potato vines, they are cheerfully accorded the right of way after the first hoeing is finished.

The wives of these men manifest more energy by far than is shown by their husbands. While the man of the house is idling about in the shade she is often to be found wielding a hoe, or trudging along after the harrow. To her is left the work of preparing wood for the fireplace, and as no wood is brought to the house from the hills she goes to the nearest rail fence for her supply.

The Russian Jew manifests no disposition to adopt the customs and methods of the men in the midst of whom he has cast his lot. He learns nothing from observation, for he never observes. He makes no effort to acquire a knowledge of the English language. He lives in filth and travels about in rags, and he firmly resists all efforts that tend in the direction of his reformation. Almost without exception every family the first year of their residence have become a public charge. They have been cared for during the winter by the town authorities. They sleep on pallets of straw or hay on the floor, and one room answers for dining-room, bedroom and kitchen. The housewife neglects her especial domain for the field, and as a consequence the living apartments of the families become nothing less than ill-smelling, filthy dens. The children, governed by no sanitary rules, are very susceptible to disease, and hardly a season passes that scarlet fever, diphtheria, measles and other contagious diseases do not break out among them in the most malignant form, and the adult members of the family show as little concern at a case of smallpox as they would at a hard cold.

The impression prevails that these immigrants are being imposed upon. A movement is on foot among the farmers of the valley with a view to preventing further immigration of Russian Jews into that section by urging property holders to refuse to sell land for the purpose of making homes for this class of persons.

THOMAS B. HOLMES, New London Co., Conn.

Dairying in Northern New York.

Dairying in its different branches is the leading agricultural industry of St. Lawrence county, N. Y. Our freight cars on the railroads, the appearance of the farms throughout the country either pastured or devoted to the production of hay, the numerous comfortable cow barns, the almost innumerable butter- and cheese-factories all show that the St. Lawrence county farmer has no thought for anything save the welfare and prosperity of his dairy. Now while there are certain branches of agriculture somewhat dependent upon the well-managed dairy, such as cattle breeding and grain-growing, yet it can hardly be advisable for a large section of country to be devoted entirely to one industry, for lower prices in that one product result in too wide a depression, in too general complaints of hard times. It is true that dairy husbandry will sustain the fertility of a farm better and for a longer term of years than perhaps any other branch of agriculture that does not take into account the purchase of fertilizers. The dairy farmer, however, would not be able to suffer materially but rather find it to his advantage to devote a few acres of his farm to the production of good winter apples; we have every advantage of climate, soil, and access to good markets to make this a profitable industry. He would also find it to his advantage to produce early lambs for market; and again, very few farmers take into consideration the possibility of a considerable profit from poultry, if properly managed. Still another source of profit open to our farmers, but shamefully neglected, is the keeping of bees; the farmer who keeps bees need keep no fewer cows, hens, or sheep, and even if producing every possible cent from the farm in other ways may add many dollars to his yearly income without losing from those other sources of profit. It would pay our farmers to diversify the products of their farms. F. K. MORELAND, St. Lawrence Co., N. Y.

Chicago Gardens.

The beautiful gardens which are a glory to Chicago must be fought for against many odds. Such is the soil of Chicago that one can hardly say it is poor; it comes nearer the truth to say there is not any. Close to the shore of the lake the sand is so coarse and porous that fertilizers sift through it almost as soon as they are applied, and there has to be kept up constantly a sort of upside-down system of agriculture, layers of rich black earth from the woods being added as a topdressing as fast as they are drained away underneath. In the springtime things look desperately discouraging for the young blades of grass when the gardeners apparently are engaged in smothering them everywhere with a thick blanket of soil, through which it takes them a day or two to struggle. Farther from the lake there is often a deposit of good, black soil on top of the lake sand, as clearly defined as the chocolate icing on a cake. It is too thin a layer to be depended upon, however, and trees not indigenous must be well looked after or they get a pitiful, anæmic look.

But, when achieved, our gardens repay us a thousand fold for what they have cost. The flowers in Lincoln Park are indescribably brilliant in color. Just as nasturtiums grow best in seashore gardens, so our begonias and geraniums seem to delight in these laboriously-prepared beds. And the popular use of the rampant and easily-satisfied wild cucumber vine gives a look of great luxuriance to Chicago gardens at small cost of money or pains. Sowing itself most prolifically, it grows thicker and prettier year after year. Best of all, however, the showers of lake water to which they are treated every day give Chicago gardens a marvelous sweet freshness. To sprinkle the family flower border and grass plat is a pleasant "chore" which the Chicago boy must do each evening. It is a task he loves, and standing, hose in hand, for an hour at a time, he gives grass, trees, house front, and passers-by a liberal bath. His father, on coming home from business, also lends a hand, and the street sprinklers, and park water wagons are busy too, so that at sunset the city looks as if just washed clean.

Chicagoans are quite as energetic in their fashions of gardening as in their wonderful building feats. Large trees are swiftly carted to and fro, and set out without much regard to season, and with no regard to expense. Under our windows last spring was a desolate vacant lot; the stoniest, raggedest, weediest one possible. Now there is a soft, thick lawn in its place. The thrifty neighbors next door—bless them!—took it into their heads to buy that forlorn patch. Two days sufficed them to level and drain it. Rich earth was carted in the next morning and at once sown with grass seed, more than half white clover. Twice a day that lawn of the future was thoroughly watered; at first by a jolly-faced, patient boy with a hose. After awhile he and we, his hearty well-wishers, exulted in the arrival of two "sprinkling fountains," delightful to watch in the morning and evening sunlight. The grass came up like a delicate green veil, but in a fortnight was strong and thick. The day before the grass seed was sown a cartload of trees had come; almost all cherry trees, full of white buds. The day the grass could first be seen the buds opened wide. When the grass grew dark and strong the robins had come for the scarlet cherries which they well knew were waiting for them. There were flowers too; vines were climbing on the fences, and the desert had rejoiced and blossomed as the rose.

E. K. WINANS, Chicago, Ill.

Beautiful Isle of Wight.

This island is one of the earthly paradises, and by no means misnamed. Words are totally inadequate to describe it so I shall not try. But I must mention the greenery and flowers! Vegetation is so luxurious, the cultivation of ground so perfect, that the results obtained are wonderful. The whole country seems a landscape garden, and the abundance and variety of flowers is endless. Even those who have seen the best in the United States would be surprised here. As to vegetables there are few in comparison with ours; the strawberries grown here are wonderful in quantity and quality, other fruits from all parts of the world are seen. Flowers are everywhere indoors and out, but the English do not mass them so effectively as we do. The colors are too much mixed, but we enjoy their beauty and fragrance nevertheless.

We are pleasantly located in a pretty home, and expect to make excursions all about the Island from this point. To-day we go on a coach to Carisbrook Castle, etc. The railway and hotel systems are not so pleasant as our own, but the universal neatness, especially of streets, roads, and lanes is worthy of imitation. Everything here seems finished in comparison with our condition. But then John Bull had one thousand years the start of Brother Jonathan, and at the rate of progress we are making, we may overtake him after all. Even if I am proud to be a free and independent American, I enjoy driving through the Queen's domain, and seeing Osborne House (outside) and its surroundings. Her Majesty comes to-morrow and of course there is no admission now. She has a nice little farm here of five thousand acres, but it does not look in better order than others. The grand ruin, Carisbrook Castle, is one of the points of interest here, and also an old Roman building, or rather what is left of it, near Newport, the Capital of the Isle of Wight. It was unearthed in 1859, and the whole plan of the house is visible—some of the mosaic floors are quite perfect still.

LUCY M. SANGER, Isle of Wight, England.

A Market for American Goods in South Africa.

Our farming population has a strong preference for American agricultural implements and goods of every kind, and a large trade with the United States may be expected in the near future. Until lately the existence of our splendid country was quite unknown to the outside world. It is a large territory, and surpasses in mineral wealth any other country I know of. So far the attention of the world has been attracted to our immense gold fields and mineral wealth, but a larger treasure lies in its fertile soil and splendid climate. I have read with great interest about the AMERICAN AGRICULTURIST competitions for prize crops, the

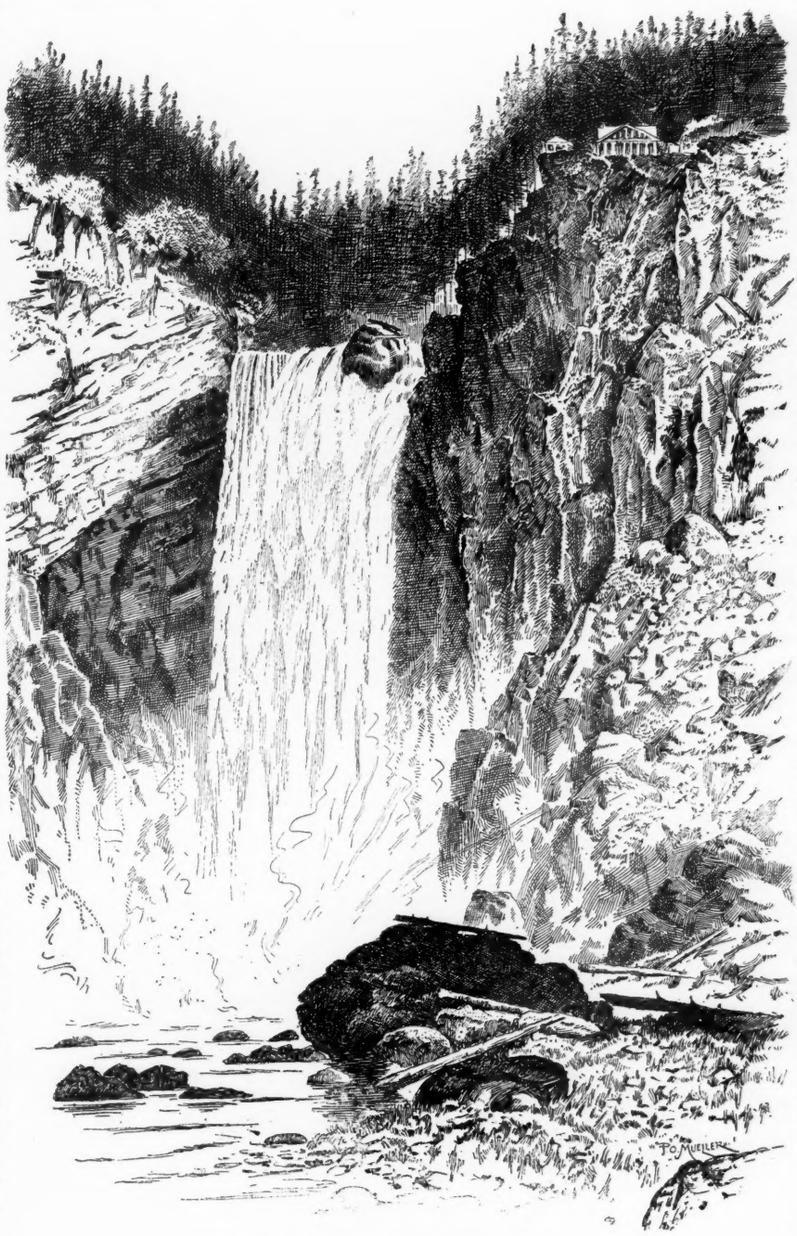
accounts of which have been of the greatest value to farmers everywhere. Yet here, often, with our primitive system of agriculture, we raise crops not far below your famous prize crops.

A. H. NELLMAPIUS, South African Republic.

A Washington Rival of Niagara.

The lower falls of the Snoqualmie river are about fifty-four miles from Seattle, by the Lake Shore and Eastern railroad. The Snoqualmie river is divided into three forks near its head, respectively called North, Middle and South Fork. They unite below the village of South Bend, at the foot of the rugged and grand old Mount Si, locally called "Uncle Si." The main river in nearing the town of Snoqualmie does not seem much, if any, larger than any of its three head streams, and is smooth and easy going, in striking contrast to its rocky bed and roaring swiftness as it comes rushing down the Cascade mountains. Tw miles or so below Snoqualmie it makes a sudden leap of 268 feet, a mass of foam-crested waves, spray and mist, only to then continue its course as calmly as if nothing had happened. There is said to be an immense hole just below the fall into which the water tumbles with a thundering noise, forever shaking the rocks, balustrades and the cozy hotel situated by the narrow road just between the fall and the mountain. The river carries on its heaving bosom, especially in the rainy seasons, hundreds, aye thousands, of pine and cedar trees, in size varying from tender saplings up to gigantic monarchs of the forest from four to eight feet in diameter—floating them splintered and torn down to the broad ocean where they become waterlogged and finally sink into the silent deep. During the rainy season, too, footlogs and bridges are borne away on the swollen torrent like so many sticks and fording becomes dangerous, at times impossible. Now and then, as happened last year, part of the rocks at the brink of the falls are loosened by the force of the water and are carried with earth-shaking force into the seething abyss. The folklore of the Siwash Indians perpetuates the belief among these simple salmon fishers—and probably with good reason—that the beautiful valley through which flows the Middle Fork and South Fork—North fork comes around northwest of Mount Si—was once a lake, and that the waters broke through at a convenient place, flooding the surrounding regions and finally passing off, leaving the soil of this whole fertile region ready to the hand of man. So much for their knowledge of the "Great Flood." They say, too, that once upon a time an Indian tribe from the other side of the "pass," north from here, invaded this valley and made war on the Siwash. A party containing eleven of these hostile Indians paddled down the river, compelling a Siwash squaw to pilot them. She did this so well as to steer them into the sheet of placid water just above the fall, where nothing could warn them of their approaching danger except the rising mist. Before the eleven braves could realize their peril she had steered the canoe toward a large boulder, jumped upon it and gave the canoe a shove which sent it skimming down the stream and over the precipitous cataract where it and its occupants were engulfed in a watery grave. The Snoqualmie Falls are a favorite excursion point for the nature-loving people of Seattle; the three hours' ride around and alongside Lakes Washington, Union and Squak, thence on into the pine forests of the Cascade mountains, being alone worth the time and money spent. There are fine mountain and salmon trout caught here, while below the fall splendid salmon are speared, and also caught with hook and line.

P. O. MUELLER, King Co., Washington.



THE SNOQUALMIE FALLS.

From the Great Wheat Region.

North Dakota is a large, grassy, rolling plain without timber except on the margins of lakes and streams. There are but few hills. On the northern boundary are the Turtle mountains, and there is a long stretch of high rolling land extending from the northwest part of the State in a southeasterly direction, designated in geographies as "the Coteau du Missouri," but we who see them constantly merely call them "the Coteaux." West of the Missouri the land is much more rolling and broken, and in the extreme western part is a group of oddly-formed and sometimes highly-colored hills which the early inhabitants called the "Bad Lands," and which still go by that name. The surface soil of the State is composed of from two to four feet of black loam, sometimes mixed with a little sand. Below this is a heavy clay marl of great depth. There are no rocks either on or under the surface except some boulders of granite or limestone brought during the glacial period.

Nowhere in the United States can wheat be grown so cheaply as on the prairies of North Dakota, where there are no stumps in the way, and no hills to climb. Both the soil and climate are adapted to the production of the finest wheat grown, and which is of world-wide fame as North Dakota No. 1 Hard.

COLIN C. THOMAS,
James-River Valley, North Dakota.

Crops in Central Iowa.

In a long experience in Iowa I have never seen better prospects for bountiful crops than this year. The early drought was broken before June commenced, and frequent showers have kept vegetation in a rapid state of growth. Corn, our principal crop next to grass, looked bad the middle of June, but the last part of the month was very favorable, and many farmers had to work very hard to get their fields plowed three times before the stalks were too tall to cultivate with the double plow in common use. There is a good stand generally and the ground is clean. All these circumstances combine in making the prospect for a big crop of corn very favorable. Oats are first-rate in quality and yield as high as seventy-five bushels to the acre. Hay has been put up in good shape and is about twice as heavy as expected. Only two showers occurred to interrupt the hay-making, the days being cool and bright for the most part. Rye is becoming a staple crop with many farmers. On level, rich land the yield is from thirty to forty bushels per acre, but on poorer, dry ground it often falls to twenty, but even then it pays, as the price is double that of oats or corn. Apples are in abundance, at least the few varieties left out of the many tried are yielding well. Oldenburg is the leading summer variety, and hundreds of barrels are shipped to the Northwest; Haas, St. Lawrence, and Snow with a few Russets, and a very small list of other kinds, furnish the remaining supply. Potatoes are very good in quality and will sell very low this fall, as might have been expected after the dollar price of last spring. The small fruit crop has not been as good as usual, owing to the late frosts in May and the drought, but the grapevines are hanging full. Moore's Early is taking the place of the Concord. Blackberries are becoming a regular feature in the garden and add to the resources for furnishing the table. The immense factory for making sugar from beets failed to materialize this summer, but a large quantity of seed was distributed among the farmers in order to test the samples raised, by another season, and a $550,000 establishment is expected to be in full operation.

A. H. SHELDON, Marshall Co., Iowa.

A Life Subscriber.—Count me a life subscriber to my old friend, the AMERICAN AGRICULTURIST.

WILLIAM RAMSEY, Hardin Co., Ohio.

A Valuable Guide.—The AMERICAN AGRICULTURIST is the finest farmers' paper published. It is a valuable guide for the farmer, stockman and gardener.

S. M. STUCKEY, Marshall Co., Ind.

FARMING IN FOREIGN LANDS.

In Hungary wheat will prove to be an average crop, while barley and maize are decidedly above the average.

The acreage planted to hops in England in 1878 was over 71,000 acres; in 1880, 66,696 acres; and only 58,000 acres in 1890.

The average annual exports of cattle from the little country of Denmark in the last few years has amounted to 90,000 head.

At the German Derby, which was run at Hamburg, the victor's prize of $13,750 was taken by Peter, of the royal stud in Gradity.

The importation of beef cattle into Munich from Austria is such that over 500 head of Austrian cattle are slaughtered there per week.

Upward of 48,557 tons of breadstuffs were exported to South Africa from South Australia last year, as against 11,512 tons in the previous year.

In Northern Servia, especially in the district of Pozareratz, the maize crop is exceedingly good, promising to be one of the best harvests on record.

An association for providing agricultural laborers with employment has been formed in the kingdom of Saxony by Dr. Von Frege, Deputy of the Reichstag, and others.

Exports of raw jute from Calcutta last year were by far the highest yet recorded. The total exceeded 512,500 tons, an increase of nearly 100,000 tons over the exports of 1889.

The climate and soil of New Zealand are finely adapted to the cultivation of oats which, besides giving a good yield per acre, hardly ever weigh less than forty pounds per bushel, and often go as high as forty-eight pounds.

It is reported from the Hankow market that the new teas are, as a rule, exceptionally good compared with those of recent past seasons. The Chinese report, however, that later arrivals may show the effects of rainy weather.

In 1882 the total exports of wool from the Australian and New Zealand colonies reached 342,815,000 pounds, the product of 77,000,000 sheep. In 1889 the export, which is now reckoned in bales, had risen to something like 1,200,000 bales.

No one has attempted to grow coffee in Fiji during the past eight or ten years, since the plantations were ruined by blight. Fresh attempts will shortly be made, however, in order to discover whether the blight has become extinct.

In the crop returns of Prussia, wheat is put at eighty-three and rye at seventy-five. Spring crops are good throughout, only seven districts reporting them as bad, while they are medium in 193, good in 234, and very good in fifty districts.

It is reported from Madras that famine threatens the principal districts there, affecting 10,000,000 people. The relief works which have been established already employ 20,000 persons. It is expected that the distress will be even greater than last year.

Returns of the Calcutta Customs show a serious decline in the export of indigo last year. There were heavy decreases in the shipments to the continent of Europe and the United States. The trade with the United Kingdom shows a less serious decline.

The latest available figures from Buenos Ayres show a total of 66,701,097 sheep in Argentina, of which 381,012 were pure-blooded, 24,322,214 native, and 42,002,871 mixed. The republic has about 35½ sheep to every square mile of territory, and 17¾ sheep per capita of population.

Mr. Barrett, a Darjeeling, India, tea-planter, is opening up some large plantations in Fiji, and is also introducing the requisite machinery. He is confident that he can make it pay well, and asserts that the tea grown in Fiji is much finer than any he has ever seen in the Darjeeling district.

A number of respectable Free State, South Africa, farmers are trekking (moving by wagon, as our own pioneers did before the railroads were built) into British Bechuanaland, where they expect to better their condition by having more room and pasture for their sheep, and other advantages.

General Delorme, Inspector General of the Service des Remontes, in the French army, has been to England with several officers to buy horses for the Cavalry Schools. He paid $30,000 for thirty-nine animals, which he took to France with him on his return. The introduction of English horses at Saumur has created considerable interest in the large breeding centers. In Normandy, Vendée, Charentes, Maçon, breeders are uneasy, seeing the foreigner patronized for horses when France herself exports more than 3,000 yearly.

The French government proposes to devote $600,000 a year for six years in bounties for the silkworm industry. This proposal is made because English silks, which are neither fortified with gum nor whalebone fiber, are growing into popular favor to such an extent as to alarm the French government.

A meeting of the shareholders of the newly amalgamated Valleyfield Dairy Co. Limited, and the Dunragit Creamery Co. Limited, was held in Glasgow, Scotland, recently, when the companies were formally wound up and handed over to the United Creameries Co. Limited, which has a capital of $225,000.

The Kildare, Ireland, grand jury not long ago awarded $3400 compensation to owners of horses maliciously poisoned at the training establishment at Kelbridge. Sir Charles Cameron, public analyst, proved that the animals died from arsenical poisoning. A veterinary surgeon, who had been arrested in connection with the affair, died in prison while awaiting trial.

The adulteration of butter, commonly practiced in the Schleswig-Holstein districts, Germany, has almost ceased. Dr. Röllig, director of the Analyzing Department in Kiel, says that in 1889, out of 346 samples analyzed 146 were adulterated, while in 1890 only twenty-four such samples were found among 458. Numberless imprisonments and fines have been inflicted.

During the first five months of this year there were 38,753 head of horned cattle brought into the market of Hamburg, Germany; 23,818 of these were imported from Denmark, 38 from Sweden, 12 from England, and 1409 from America. The rest were from various parts of Germany. Of pigs the same market received 172,612 head, 77,212 of which came from Denmark.

The wheat crop of India this year, according to the Revenue and Agricultural department is 6,250,000 tons, from 26,250,000 acres. Of the total yield the Punjab supplies 2,071,000 tons, the Northwest Provinces 1,745,000 tons, Central Provinces 910,000 tons, and Bombay 553,000. The area sown this year exceeds that of last by 1,651,000 acres, and the outturn is greater by 689,000 tons.

A fortunate farm laborer in Kent, England, has attained to considerable skill in the very difficult business of catching stoats alive. These animals are similar to the ferret and weasel and are particularly fond of killing rabbits. The man receives $1.80 from an Australian agent acting for the govment of New South Wales for each stoat, the animals being in great demand for thinning off the rabbits.

The locust bean crop in the island of Cyprus this year promises to be the heaviest on record, owing to the plentiful winter and spring rains. The beans are of unusual size, and the weight on the trees is so great that a large number of them have branches broken down. The barley and wheat crops have also been above the average, but the former, however, has been much discolored by harvest rains.

The Treasurer-General of Cape Colony, South Africa, states that the value of breadstuffs imported into that colony last year was over $1,250,000, and yet many parts of South Africa are highly favorable to the cultivation of grain, and only await development. In fact, there is enough of this excellent grain land in the colony to supply all home wants and leave a large surplus for export if it were taken up and cultivated.

Mr. Charles Gardner, British Consul to Hankow, mentions in his report to the Foreign Office that whereas in 1886 some 40,000 pounds of tea were exported from Hankow to London in 1890 considerably less than one-third of this amount was sent. He thinks that Ceylon is entirely responsible for the diminished export of Chinese tea to England, and that, although the export of Chinese tea to Russia has nearly doubled of late, Russia will before long look to India for the bulk of her tea.

According to the statement of a committee of the Indian Tea Association, of Calcutta, the total tea product of India last year was 105,836,106 pounds. The total of the shipments from May 1, 1890, to March 31, 1891, was 104,954,625 pounds. The difference between this total and the crop apparently represents the local consumption and the unshipped stock. The estimates for the coming season promise a crop of 119,790,011 pounds, but the actual outturn, as a rule, appears to fall short of the estimate.

The frozen meat trade of New Zealand is expanding at a rapid rate. To meet the necessities of greater carrying space the New Zealand Shipping Company have had built several cargo steamers of 6,000 tons capacity each, in addition to the mail boats belonging to the same line. Two of these ships recently discharged at the Royal Albert Dock, London, England, 65,000 and 58,000 frozen carcasses respectively, besides general cargoes of butter, cheese and wool. Several other vessels near about the same time discharged from 20,000 to 30 000 each.

Europeans cannot buy land in Java for planting out to coffee. The government grants a seventy-five-years' lease, and payment of rent begins after the seventh year. The government allots the districts which are to be planted to coffee. To the natives the land is given for planting purposes. One native prince, Mankoe Nogoroe, called by the natives Kandjeng Goesti (God Almighty), gets $28,000 annually for the coffee grown on his land. This powerful prince keeps up his own standing army; cavalry, infantry, and artillery. He lives at Solo, the native name for Socrakarta, in mid-Java.

At a dairy near Edinburgh, Scotland, there has recently died a gray charger which rode through the "Valley of Death" along with the immortal "Six Hundred." He also went through the Indian Mutiny. At the charge of Balaklava he received a bullet in the neck, the mark of which he carried to the grave. The old horse always retained a keen sense of military discipline, and up to the last, at the trumpet's blare, he would cock his ears and come to attention. He repeatedly withstood the thunder of a local battery of 68- and 32-pounders with the most perfect composure and indifference.

The Egyptian government has established an agricultural college at Cairo, which appears to be doing good work and is heartily appreciated by the agriculturists in the land of the Pharaohs. Besides a course of lectures on various scientific subjects, practical work is being carried on. A garden and farm of three hundred acres are attached to the college. European agricultural implements, such as plows, scythes, and reapers, have been introduced for trial. About sixty students have been admitted, and it has been found necessary to refuse a large number of applications for admission. Truly Egypt is awakening from her deathlike sleep!

Complaints of the adulteration of Bombay cotton have been many and serious in Liverpool during the past few months. The grievance, however, is not confined to English exporters, for a number of Hongkong merchants have drawn attention to the practice of labeling inferior Bombay yarn under marks denoting a superior quality, and the secretary of the Millowners' Association, at Bombay, has been written to on the subject. He suggests in reply that buyers should abstain from dealing in yarns "on the quality of which their experience shows they cannot rely;" a strangely indiscreet recommendation in view of the widespread and growing adulteration of Bombay produce.

The production of condensed milk in Norway is annually increasing. The value of last year's exports is estimated at about $542,900. The following figures show how steadily the exports have grown in the last twelve years: 1879, 16,275 pounds; 1880, 955,750 pounds; 1881, 963,948 pounds; 1882, 924,299 pounds, a slight falling off from the previous year, but more than made up in 1883, when the export amounted to 1,332,159 pounds; 1884, 1,384,380 pounds; 1885, 1,789,505 pounds; 1886, 2,375,797 pounds; 1887, 3,797,659 pounds; 1888, 4,683,320 pounds; and 1889, 5,284,702 pounds. These figures are approximately correct, being a round reduction into pounds of the French kilogramme used in the original official reports. The Anglo-Scandinavian Condensed Milk Co. has almost completed the erection of another large factory at Sannesund. As the price paid for the milk at the factories is said to be a little higher than the farmers themselves could get out of it, this industry has proved a boon to the neighborhoods of factories. New milk-condensing factories are projected at Kopand at Joderen. This industry, which is constantly growing, ought to prove a profitable one in the dairy regions of the United States, since the article could be exported to all parts of the world, and is now largely used in many parts of this country, and has been for years.

SCIENCE IN FARMING.

Farmer, Soldier, Scientist.

STEPHEN ALFRED FORBES, PH. D., was born at Silver Creek, Ill., May 29, 1844. His father was a pioneer farmer, born in Vermont of Scotch stock, the immigrant ancestor coming to Massachusetts in 1650. The mother of our subject belonged to a Dutch family (Van Hoesen) which settled in the Valley of the Hudson late in the seventeenth century. Young Forbes lived upon the home farm until seventeen years old, when he entered the army as a private in the Seventh Illinois cavalry and, after serving four years (four months in prison), was mustered out as captain of his company. He was educated at Beloit academy and the Rush Medical college. The degree of Ph. D. was later conferred by the Indiana State University. The study of medicine attracted Dr. Forbes's attention to natural history, and he soon became acquainted with the botany and afterward the zoölogy of his region, and for the systematic pursuit of the latter subject he gave up medicine and changed the whole plan of his life. In 1876 he began a careful study of the food of our common birds, a subject closely related to agriculture, which has since engaged much of his time, and is still unfinished. The stomachs of ten thousand birds, preserved in alcohol, await opportunity for study in his laboratory. A similar microscopic research upon the food of certain families of beetles led to an interest in economic entomology, and as State Entomologist Dr. Forbes has worked continuously in that field for the past eight years. He has, for example, completed the life history of the corn-root worm, and demonstrated thereby that rotation of crops is a full remedy. In like manner Dr. Forbes's studies of the Hessian fly, wheat-bulb worm, corn-plant louse, white grub, chinch bug, codlin moth, and the contagious diseases of insects, have all been of great value to crop-growers everywhere. Concerning the bacterial diseases he has demonstrated that it is practicable to disseminate the germs by artificial cultures. In 1877 Dr. Forbes founded the Illinois State Laboratory of Natural History: became its first director, which position he still holds. He instituted the natural history survey of Illinois. In 1882 he became State Entomologist, and has written reports aggregating over a thousand pages of economic material. He has published many other works of practical value to the crop-growers, and since 1884 has been professor of zoölogy and entomology in the Illinois Industrial University. To say the least, Professor Forbes has been busy and useful, adding much information through his investigations that is both an addition to pure science and of practical bearing upon the arts of rural life.

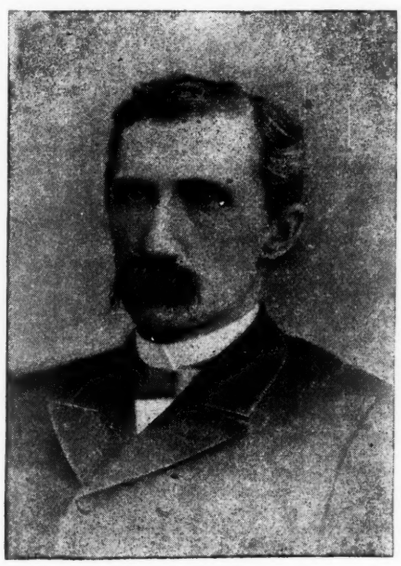
Gleanings from the Bulletins.

DELAWARE—No. 13, pages 16. The leaf blight of the pear and quince receive attention in this bulletin and the following results are obtained: The ammoniated carbonate of copper, the modified Eau Celeste, the carbonate of copper and carbonate of ammonia mixture and the Bordeaux mixture all control the leaf blight of the pear. The ammoniated carbonate of copper is apt to injure the foliage, and produce a russeted appearance of the fruit when used in excess. The carbonate of copper and carbonate of ammonia has this effect to a less degree and is cheaper. The Bordeaux mixture is too expensive and troublesome except in very serious cases. The modified Eau Celeste, and the carbonate of copper and carbonate of ammonia mixture are the two cheapest as well as the most effective fungicides for the treatment of pear and quince blight. Make the first application early when the leaves are one-half to one-third grown, following by others every three or four weeks for four applications.

GEORGIA—No. 13, pages 20. In the growth of forage plants the food supply may be divided into commercial fertilizer, green manuring, and barnyard manure. The failure of Georgia farming is largely due to the injudicious use of commercial manures, and the growth of one crop indefinitely upon the same land. The importance of green manuring is fully shown, and the power of leguminous crops to take up nitrogen discussed. The conclusion is that root tubercles are an active factor in this very important work. Cow pea is one of the most valuable crops in this connection as a renovator of soils. Barnyard manure is the substance by means of which the valuable constituents removed by a crop can be returned to the soil.

MISSOURI—No. 15, pages 16. In the tests of wheat Fultz led in yield, red chaff second. During the next year the order was changed, and more time is needed to conclude the work. With oats Pringle's Progress did the best. There was a marked difference in yield and date of ripening of same sorts of oats and potatoes procured from different seedsmen. Oats and potatoes respond more readily than wheat to changed conditions. The results show the danger of an indiscriminate change of seed. Also the vigor of seed influencing the crop.

MASSACHUSETTS—No. 40, pages 16. A rotting of lettuce is reported upon as caused by a fungus; the remedy consists in removing all sources of infection. Affected plants should be burned. A greenhouse that has been badly infested by the disease should be thoroughly cleansed, whitewashed, and supplied with fresh soil. A powdery mildew of the cucumber is another fungus upon greenhouse plants. Frequent sprayings with a solution of sulphide of potassium, one ounce to three gallons of water, is effective. In the feeding tests with steers it was found that corn ensilage fed either with wheat bran and gluten meal, or with wheat bran and old-process linseed meal has



DR. STEPHEN A. FORBES.

produced in this case, without an exception, the highest gain in live weight, as compared with other rations used. The increase in live weight per day has in one-year-old steers exceeded three pounds, while with two-year-old steers it has been more than four pounds. The cost of the feed has been from twelve to fifteen cents.

NEW YORK (Cornell)—No. 30, pages 42. In this report of some preliminary studies of the influence of the electric arc upon greenhouse plants it is shown this light promotes assimilation, often hastens growth and maturity, and is able to produce natural flavors and colors in fruits, sometimes intensifying colors and increasing the production of flowers. Periods of darkness are not necessary to the growth and development of plants, and it is thought that the electric light can be profitably employed in growing plants where the adjustments of conditions have been properly made. Plants do not need rest at night as animals do but simply adapt themselves to the alternating daylight and darkness. If the light is continuous the growth is continuous. Better results follow from the use of the arc light after the plant is well fixed in the soil than during germination. There is a probable future for electro-horticulture.

NEW JERSEY—No. 81, pages 16. This bulletin deals with incomplete fertilizers and home mixtures, and concludes that while standard fertilizers are reasonably uniform in quality, the safest method of buying is that which makes guaranteed composition of the unit system the basis of contract. In buying materials of a variable character a careful study should be made of the relation between guarantee and selling price. Variations in cost of plant food depend less upon where it is bought than upon how it is bought. With ordinary facilities farmers can make mixtures of raw materials which compare favorably with the manufactured brands, with a considerable saving of cost. In this way a definite knowledge of the kind and form of plant food is obtained and the preparation of formulas suited to the particular soil is possible. To secure the greatest advantages for fertilizers the user knows that the chief elements of direct plant food are nitrogen, phosphoric acid, and potash, and how and when to buy them in the best forms. He should likewise study the special requirements of the soil.

NORTH CAROLINA—No. 78, pages 32. In this bulletin is a full display of the formulas for insecticides and the apparatus used in applying them. This is followed by illustrated descriptions with remedies for many enemies, as for example, the cotton caterpillar, boll worm, greasy cut-worm, bud worm of corn, chinch bug, Hessian fly, grain plant-louse, grain weevil, cabbage butterfly, potato bug, tomato worm, apple worm, and a score of other pests. The treatment of each species is followed with the most approved method of treatment.

UTAH—No. 7, pages 20. This bulletin deals with the draft of mowing machines, and it is shown that the draft varies with the speed, and with the point of attachment for draft. An old machine in good repair drew easier than a new one. A six-foot cutting bar drew easier per foot of cut than a four and a half-foot bar. A tight pitman gave less draft than one run loosely. Draft is increased when guards are out of true, and decreased ten pounds when the mower walks. A summary of all tool trials is also given.

VERMONT—No. 24, pages 16. This bulletin is devoted to the potato blight and rot, and emphasizes the fact that by spraying with the mixture of copper sulphate and lime, known as the Bordeaux mixture, the blight of the tops can be checked, and that by using this remedy to stop the blight on the tops most of the dry rot of the tubers can be prevented. The bulletin gives a full account of the experiments upon which the above results rest. In applying the remedy do not wait until the blight begins to spread badly, or it may be too late. The rot shows itself first at the stem end, which may be due to the fungus entering the tubers from the stem above.

VIRGINIA—No. 10, pages 30. From the experiments upon steer and pig feeding, the following inferences are drawn: A narrow ration is not fed with economy, and may cause death through lack of power of the animal to assimilate such concentrated food. No difference is made in the proportion of fat and lean meat in pigs fed corn meal alone and corn meal, beef scrap, and bran. The cost per pound increase live weight is a half cent per pound in favor of the bran-fed lot. As a whole the second food was the more economical, owing perhaps to the greater relish with which it was eaten.

WISCONSIN—No. 28, pages 16. In this bulletin upon silos the following points are considered:—Kinds of silos, importance of thorough ventilation, paint for wood linings of silos, stone or grout silos, lathed and plastered silos, metal, shingle, and paper-lined silos. The form and dimension of silos, the importance of feeding from the top and the use of partitions, smoothness of silo walls essential, the covering of silage, protection against rats, against freezing. Construction of wood silos, the comparative expense of different kinds of linings for round silos, the construction of stone silos, and the cost of the three types of silos compared. The round silo is much the cheapest.

WYOMING—No. 1, pages 24. This is the first bulletin of a newly organized station and deals with the proposed work in the various departments. There will be extensive grass experiments without irrigation by the botanist. The horticulturist will experiment with garden vegetables, fruits, selection, propagation, and vitality of seeds, etc. The flora of the university farm is given, and the weather report for two months.

TEXAS—No. 16, pages 16. This is a bulletin upon many subjects in horticulture, as effect of drainage, testing of strawberries, methods of setting the plants, and copious notes upon the introduction of Russian fruits and ornamental trees. The lists are very full and form a basis for future work.

The President's Indorsement.—The crop reports and harvest summary in the AMERICAN AGRICULTURIST for September attracted widespread attention. A digest of them was given to the Associated Press, and is believed to have had a great influence in advancing prices. Our facts appeared in the daily papers Monday morning, Aug. 17, the day on which wheat went to $1.13 at Chicago. Many brokers who had previously been bears are now bulls, and believe in the probability of dollar wheat as the average price to farmers. In his speech at Albany, N. Y., Aug. 18, Mr. Harrison, the President of the United States, said, referring to the AMERICAN AGRICULTURIST and its annual crop review: "*The leading agricultural journal* estimates that the produce of our farmers will be worth one billion dollars more this year than ever before."

A Safeguard Against Drowning.—J. Flomerfelt, Somerset Co., N. J., writes that many persons are drowned because they do not know that a body weighs only one pound when in the water. People drown for want of air. Many who would otherwise drown would be rescued by remembering the fact that any small object would keep them afloat if they would be satisfied to keep only the nose out of the water. An empty bottle would answer the purpose for hours. A capsized boat will keep more persons from drowning than it would carry right side up if they will but remember that one pound will keep them afloat if they place only weight enough on the gunwale to keep the nose above water.

Starry Campion.—D. E. Robinson, Juniata Co., Penn. The plant sent is *Silene stellata*, Ait., Starry Campion, or Starry Catchfly, a common weed in the Eastern States.

Profitable Pork-Raising.—M. Carroll, Ingham Co., Mich., writes: "I have an interest in a pig-farm in Illinois. Formerly we had a good deal of sickness among our hogs. We then fed corn in the ear exclusively. But, seeing in the AMERICAN AGRICULTURIST an article against the exclusive feeding of corn, we changed our plan of feeding. We had well-cured corn shelled and ground with wheat, oats, and peas, and fed it after being soaked in water twenty-four hours. The feed was quite thick. We cut green, tender meadow grass and fed once daily, and we have seldom lost a hog since. As we were benefited by your magazine it is no more than fair that your many readers should profit by our experience."

Onion Culture.—J. D. C., Longmont, Col.: In the Eastern States what we called bottom lands, or those lying in the valleys or creeks and rivers, as well as drained swamps, are considered preferable for onions, although almost any soil not too porous to retain moisture will yield paying crops of onions. In the Western States new black prairie soils have proved to be excellent and well adapted to the production of this "fragrant bulb." On new soils there is less difficulty in keeping down the weeds than on old ones; hence, these are usually preferred. Sowing the seed in the fall would scarcely be advisable in Colorado, because light showers or snows might cause it to sprout and then severe freezing would kill the young plants. Get your land in as fine a condition as possible in the autumn and then sow early in spring, and give good cultivation, and irrigation if necessary, and you will scarcely fail to secure a large yield.

Forage Plant Wanted.—F. C. Farnham, Kittitas Co., Wash.: We are somewhat in doubt as to the best hardy perennial forage plant for your sandy soil, but if you have much cold weather and the ground freezes to any considerable depth in winter the Johnson grass or perennial sorghum would not answer. If sainfoin succeeds then alfalfa would certainly thrive and probably yield more forage per acre. Why not try some of the most popular cultivated grasses, and especially orchard grass (*Dactylis glomerata*), which is a rank growing species, very hardy and thrives best on light, wet soils. If cut early it makes excellent hay for both horses and cattle, and in nutritive properties it has few superiors. Try an acre of this, another of Italian rye grass, also one of Timothy and Red-top and determine by experience which are best adapted to your soil and climate.

Pinching Melon Vines, Sweet Potatoes.—Alex Jewell, Lancaster Co., Neb.: What is meant by pinching melon vines is that when they have reached out several feet from the root, and as many melons have set as would be likely to mature, the ends of the vines may be pinched off to prevent further extension in that direction. This pinching will cause the sap to flow into the fruit and leaves remaining instead of being wasted in producing useless vine growth. The same system is practiced in growing grapes, and by forcing the entire strength of the vine into a less number of leaves, canes and fruit we secure better results than to allow Nature to take her own way in rambling. It will not answer to cut away the vines of sweet potatoes while growing. The tubers may be kept over winter by packing in kiln dried sand, dry wheat or oat chaff or cut straw, but after being packed they must be stored in a very dry and warm cellar or room. The tubers must also be well ripened, sound and without bruises, else they will not keep for any considerable time.

Rotation for Wheat.—C. C. Gibson, Whitman Co., Wash.: The land in potatoes this season would certainly be preferable for wheat to that now either in oats or wheat, because it is always desirable in adopting any system of rotation for farm crops to make the change as great as possible. Wheat should not follow oats, rye or other closely allied grains, not only because there is danger of increasing their natural insect pests but of the transmission of their fungous diseases, such as smut, rust, and mildew. Land occupied by what are called hoed crops is usually in excellent condition for the reception of the seeds of cereals, and whenever it can be done these should follow them. Next year use your wheat and oat field for potatoes, corn and similar crops, adding fertilizers in amounts required to secure a good yield.

Charcoal as a Fertilizer.—Thomas Jessop, Beulah, Tasmania, writes us that clearing land of timber is the principal work on the farms in their locality. Large quantities of charcoal are thus obtained which, if it possesses any fertilizing qualities, might be used extensively and be of great help to them. The principal value of charcoal consists in its oxidizing powers and the power of the coal to absorb gases which react chemically one upon the other. In very heavy soils they may also exert mechanical amelioration.

Grafting the Grape.—James J. Hubley, Placer Co., Cal., writes us that grape grafting is quite common in California, whole vineyards being planted with wild vines and grafted to cultivated varieties. Some vineyardists make a common cleft graft, using clay instead of wax, and others simply hill up with the soil. He has also tried the incision graft, pulling away the soil from the vine from about three to six inches below the surface, making the cut into the vine at an angle of about forty-five degrees, then hilling up and leaving the tops on. For this system is claimed the advantage over others, that if the cion fails there will still be a crop from the original vine, which may be re-grafted the following season.

Tethering Cows.—T. M. Morgan, Fauquier Co., Va., asks for the best method of tethering cows. On the Channel Islands, in France, Holland and in Germany, many cows are tethered, but also more are pastured. The best tether is a halter with a swivel and small chain of desired length, fastened with an iron pin with swivel pushed into the ground by a swaying motion. This pin, eighteen inches long and pointed, enters the ground easily and can be readily drawn out at pleasure. Rope is cheaper at first, but in the long run the chain is best. A chain round the neck gives the animal too much power, so that iron pins are drawn out of the ground by the cows persisting in reaching for grass just beyond the limits of the tether; but the corkscrew-like pin so commonly used in some parts of the West may be screwed into the ground, and the animal tethered rarely pulls it out under any circumstances. The more perfect tether has a firm fastening in front of the nose-piece of the halter. This keeps the tether more free from the mouth and feet of the grazing animal. Tethered animals should be frequently changed from place to place, so as to preserve the pasture from injury. In this manner the pasture may be systematically grazed many times during the season without injury to the pasture or meadow. Tying a rope round the horns is a bad practice, as the rope shrinks in the rain and painfully binds the tender roots of the horns and head. Ropes kink badly when wet, and are soon destroyed. Small linked chains seldom become entangled and never cut the feet like a wet rope.

Powdery Mildew on Cucumbers.—This disease was reported last season on the leaves of greenhouse cucumbers, by Prof. L. H. Bailey, of Cornell University, and Dr. Jabez Fisher, of Fitchburg, Mass., to Prof. J. E. Humphrey, of the Massachusetts experiment station. The fungus is known as *Oidium erysiphoides* Fries, var. *Cucurbitarum*, and is the summer spore stage of one of the fungi known as powdery mildew. The perfect or winter spore form is not yet determined. The fungus first appears on the upper surface of the leaves in rounded white spots, which enlarge until the leaf is practically covered. The diseased parts soon turn yellow, and finally become dead and dry. Under favorable circumstances the disease is very destructive and spreads quite rapidly. Prof. Humphrey publishes an account of this mildew in bulletin No. 40, and says it may be held in check by frequently spraying with one ounce of sulphide of potassium (liver of sulphur) in three gallons of water. When the disease has once got a foothold the house should be thoroughly cleaned and fumigated, and new soil put in before another crop is started.

To Renovate an Apple Orchard.—A correspondent from New Brunswick, Canada, writes: "I have an orchard of bearing apple trees that I am puzzled to know how to manage. It bears fairly well. The branches are so near the ground and the trees so close together that I do not think I can plow it, and the sod is so thick that topdressing does not much good. It is seeded to clover, orchard grass, wild peavine, etc., and gives fair crops of hay, but not nearly so good as I wish. Would it do to make a pig pasture of it, fence it well, and keep the pigs there all summer?" Certainly; you could not do a better thing. Feed the pigs well, and keep enough of them to eat the grass down into the ground. If the trees are too thick cut out every other one, or prune savagely. If your orchard bears "fairly well" you need not lament the failure of the hay crop. You ought not to expect a large crop of hay and a large crop of apples from the same land. If pasturing with pigs does not make the land rich enough for the trees give them a topdressing of manure or commercial fertilizers.

The Rotting of Winter Lettuce.—This has caused much loss to gardeners who grow lettuce for a winter crop. It generally appears above the ground and at the attachment of the lower leaves to the stem, and from here it spreads through the head, which finally becomes a mass of rotten stuff. Prof. J. E. Humphrey says in bulletin No. 40 of the Massachusetts experiment station that he believes the rotting to be caused by one of the imperfect fungus forms known by the name of *Botrytis* or *Polyactis*. This fungus appears to develop a saprophyte on old leaves and other vegetable refuse, and may thus survive a long time, or until the next crop. The only preventive offered for the disease is to remove all affected plants and burn them, and any and all other breeding places. Thoroughly clean, paint, or whitewash the greenhouse, and put in all new soil before the next year's work begins.

Riding on Sulky Plows.—A. S. Terrill, Hancock Co., Ill., desires information of the AMERICAN AGRICULTURIST as to riding plows which require the least draft and do the best work. He writes us: "Many of the manufacturers claim that these plows require less draft than walking plows. I cannot see if you add to a breaking plow the weight of a sulky and rider how it will run lighter than a hand plow." The question of a few pounds less or more draft is of little or no consequence. We want to save man-power rather than horse-power. When we were a boy we had to walk behind the roller, harrow, cultivator, and plow. Now we ride. We work fewer hours; do far more effec-

tive work; are not so tired; and when we get home from the field the labor or force that has been saved can be used in taking better care of the horses, cows, and other stock. To walk when one can ride, especially during the hot weather, is folly. For use on our own farm we want a sulky plow that is so constructed that with a lever the weight of the driver can be readily thrown on the wheels when plowing a sandy knoll, or on the beam of the plow when we strike a hard, clayey spot. On such land a sulky plow, arranged so that one can put one's weight on it on the hard spots, will do far better work than can be done with a walking plow. Furthermore, the saving of points will pay a big interest on the extra cost of the plow. When one can ride on the plow in the hard spots it is not necessary to put on a point so often. On our own farm we use three horses on the plow. We have plows that two horses will draw as easily as three horses will draw another plow in the same land; but we are always afraid that the easy-running plow is shirking the work. It does not break up and turn over the whole soil. Get the plow that will do the best work, even if it requires ten or twenty pounds more draft than some others.

Squire Kent. — We regret to learn that the famous Guernsey bull, Squire Kent, a portrait of which was published in our May number of this year, died recently. He was running in a wooded pasture surrounded by a barb wire fence. One side of the woods has a steep declivity, and in running down it he became entangled in the wire and died from the injuries received.

Angora and Cashmere Goats.—S. B. Hellier, of South Africa, informs us that there are over three millions of Angora goats in the colony. These goats yield a fleece of several pounds of mohair, while the cashmere goat produces but a few ounces of fine down under a coat of coarse hair.

Saddle-Back Caterpillar. — C. M. Grow, Jr., Frederick Co., Md.: The small oval-shaped caterpillar covered with fine brownish hair underneath and clusters of minute spines at the sides of each segment is probably *Empretia stimulea*, but your specimen had partly moulted in transit; consequently was not in first-rate condition for identification. There are several species of moths with similar rather curious caterpillars or larvæ, some being covered with soft fur-like hairs, others with curious marks on the back, like this one called the saddle-back, because there is a broad elliptical reddish spot edged with white on the back. The moths are rarely seen even by collectors, but are of rich deep velvety reddish brown, and the wings expand about one inch and a half. The caterpillars feed on the leaves of the apple, blackberry, and other cultivated fruit trees and bushes.

Sheep Manure.—Robert S. Clark, Yavapai Co., Arizona: Next to hen manure, sheep manure is considered the most valuable fertilizer made on the farm. As a rule, it contains very much less water than manure from cattle. It makes an excellent fertilizer for strawberries and other garden fruits.

The Best Nest Egg.—A. T. Goldsborough, D. C., writes us that the easiest and best way to make nest eggs is to make a small hole in one end of the egg and a hole as large as the end of the little finger in the other, and instead of breaking half a dozen eggs for an omelet blow out the contents: Set them on the end, make a plaster of Paris solution, pour it into the shell and let it set. Leave the shell on, and neither the hens or any one else can tell it from a fresh egg.

Apple Tree Blight.—O. W. Byrne, Fulton Co., Ill.: If the twigs of your apple trees have been killed by the twig-borer you would either find the insects in them or their minute burrows where the wood had been eaten away. But from your description of the trees we are inclined to think they are attacked by a disease known as the apple and pear blight. This disease usually appears on the most vigorous and tallest shoots of the top, and from there it passes downward to the larger branches and main stem, the leaves withering along its course and the wood and bark becoming black as though scorched by fire; hence, one of its common names is fire blight. Sometimes this disease may be checked by cutting away infested twigs and branches as soon as discovered, and immediately coating the wounds with ordinary white lead paint. There is no remedy known for this disease, and it usually attacks the most vigorous and rapid growing specimens in the orchard. On poor or only moderately fertile and dry soils this disease is almost, if not entirely, unknown.

Osage Orange Hedges.—J. E. E., Oneida Co., N. Y.: We would not recommend the osage orange as a hedge plant anywhere in what is called "Central New York." As a rule, this plant is not hardy so far North, but single specimens planted in moderately dry and fertile soils may grow and thrive for years, but when set in a hedge and pruned into proper form the new growth is very likely to be killed back in winter. This is often the case in the suburbs of New York city where the winters are not nearly as severe as in the center of the State.

Curing Hay. — Ernest Pugh, Lane Co., Ore.: Curing hay when showers are frequent is rather difficult, but there can scarcely be any question about the advisability of stirring it frequently for the purpose of shaking out the moisture and admitting the air to that lying in the swath, windrow, or if put up in cocks when wet or moist. Hay will dry more in one hour if well shaken up when the weather is clear than in twelve or twenty-four if left untouched as it fell in the swath, or as scattered by a hay tedder.

Squash and Potato Stalk Borer. — A. G. C., Leavenworth Co., Kan.: The squash and pumpkin borer (*Melittia cucurbitæ* Harris) is a difficult insect to get rid of, but it may in some instances be driven away by the use of coal tar mixed with ashes or plaster and thrown about the plants early in the season. The potato stalk borer (*Barridius timotatus*) is a well-known insect, but the larvae or grubs are only one-fourth of an inch long; consequently, you must have some other insect in your potatoes if the grubs are an inch and a quarter long. We would be pleased to see a specimen.

Wild Oat. — Frank A. Heath, Grand Fork Co., N. Dak.: The wild oat you send is the *Avena fatua*, Linn, and while it is supposed to be a native of the Mediterranean region it has become widely distributed over the world in grain-growing countries. It was probably introduced into the Dakotas with other varieties of the oat and has run wild or become naturalized. It is mainly valuable as a forage plant and is often cut and cured for hay when sufficiently abundant. It is supposed to be the original of the cultivated oat, and if given the same care and attention it may be improved so much that the grain will adhere as closely as the cultivated varieties, besides increasing greatly in size.

Checking Growth.—Louis Rostetter, Allen Co., Ind.: Your unfruitful plum trees, which are now making such a vigorous growth, may receive a check in a year or two by an unfavorable season, or you can allow the grass to grow up about them until they settle down to business and fruit buds are developed, and then return to good and clean cultivation. Sometimes young fruit trees grow so rapidly that fruit spurs are not developed for several years, but it is far better to wait for the fruit than to obtain a little early, and have to wait for the trees to grow large enough to produce a good crop.

Sweet Clover. — William H. Udall, Pierce Co., Wash.: The specimen of plant you send is the common sweet clover (*Melilotus alba*). It is a native of Europe, but has now run wild and become thoroughly naturalized in this country. It has often been recommended as a forage plant, but it has such a strong, rank taste when young and the stalks become so hard and woody when old that neither cattle or horses will eat it unless forced by hunger. In the older States this plant is considered an intruding weed, although sometimes admitted into gardens on account of its fragrant flowers.

Club-Root in Cabbages. — L. A. Ashenfelter, Clearfield Co., Pa.: There are two distinct forms of club-root affecting cabbages, one is caused by a fungus and the other by the larvæ of a small two-winged fly (*Anthonyia brassicæ*). The remedy or preventive in both is the same, that is, never sow the seed, or plant cabbages on the same ground two years in succession. If the plants are raised in frames see that the soil is fresh and new, and that none but very old and clean manure is used. For late cabbages sow seed on a burnt seed bed. To prepare such a bed make the soil rich if it is not so naturally, and then cover with brush, straw, or some similar material that is dry, and then set it on fire, and when all is burned rake in the ashes and sow the seed. The heating of the soil will not only destroy the larvæ of insects in it but the spores of fungi. Cabbage plants raised under such conditions will not be affected with club-root, if planted in the ground where no turnips or cabbages were grown the season previous. Application of lime or ashes are also beneficial to soils that have long been used for garden vegetables.

Millet Grass. — R. H. Thomas, Douglas Co., Wash.: The grass which you say has shown up "immense" this season with you is known here as Millet Grass (*Panicum miliaceum*), and a valuable forage plant for light, warm and rich soils such as you describe. For hay this grass should be cut early, that is, just as soon as the heads are developed and before the seed is formed, and if cut thus early and well cured it makes a very nutritious hay, although, unless sown thick, the stalks are rather coarse and woody. This grass is an annual and the seed may be sown rather late in spring and not before the ground has become warm enough to insure germination of the seed within a few days. If sown early and when the ground is cold and wet the seed is very likely to rot. You can obtain the seed of this millet at almost any of our seed stores, as you can see by consulting their catalogues.

Petting Heifers.—"Pro Bono Publico," Suffolk Co., Mass.: Many writers on dairy subjects recommend handling the udder of the heifer for the purpose of making it larger and also to get better command of the heifer. Any one that is familiar with the "pets" of the farm will question the propriety of increasing their number. Handling young animals is very apt to make them too familiar, even up to viciousness. It is probably best to treat all the farm animals in a strictly business way. Kind but firm, and have little to do with toying with them until you are ready to put them at work. Properly handled, any heifer can be made to do her best after coming in, though she may never have been touched by human hands before. Holding up the milk is one of those vicious habits that too much familiarity has developed in the cow.

What to Plant.—Mrs. M., Otoe Co., Neb.: Before deciding upon the kinds of fruits and vegetables to be planted it is always well to learn, if possible, the demands of one's local markets, and if not well supplied with small fruits or vegetables take either, as circumstances seem to dictate. If small fruits, then cultivate a sufficient variety or number of kinds to keep your extra help employed as many months as possible. Plant half an acre or an acre each of strawberries, black and red raspberries, and perhaps blackberries, with currants and gooseberries; and with these you can keep the pickers and baskets and crates employed for a number of weeks, and provide a steady income for yourself. If you decide on vegetables pursue the same course, opening the season with spinach, lettuce, and radishes in frames, ending with late cabbages, turnips, beets, carrots, celery, cauliflowers, and parsnips. Decide first what you will do, and then pursue it to the end.

Fall Plowing.—Walter Clark, Wake Co., N. C., desires information whether it will pay to break up land in the fall to be used for crops the following season. This is a rather difficult question to answer without full information of the character or present conditions of the land to be plowed or broken up; and, furthermore, the weather immediately following the plowing may make a great difference in the result. For instance, if the land is now in grass or covered with weeds, and this vegetable matter is turned under early in fall, and heavy rains and warm weather follow, all will be so thoroughly rotted as to form an excellent seedbed when brought to the surface in spring. But should conditions quite the reverse of these named follow the autumn plowing, then we would prefer deferring the plowing until spring, leaving the roots of the growing crop to push down to the decaying vegetable matter underneath. Inverted sod in spring is usually considered good corn land.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

OCTOBER, 1891.

The Ascendancy of Co-operation.

Associated effort is quietly making grand advances. It is getting upon a substantial basis. The failures in co-operation are what the public hears of, together with the pretentious schemes so loudly advocated by enthusiasts who are usually as impractical and inexperienced as they are well meaning.

Successful co-operators are mostly too busy attending to their own business to advertise their success. Indeed, the established co-operative enterprises of to-day let their work speak for itself, in marked contrast to the magnificent claims put forth by less sensible and more wildly-zealous would-be co-operators. The latter are of the class who always hinder the practical progress of genuine reforms.

The great point thus far established by co-operative success in America is this: That co-operation is not a new method of transacting business, but simply a different way of dividing the profits of industry—to labor rather than to capital. Co-operation hires capital, pays a fair price for it, and divides the profits pro rata among the workers or those who have contributed to its success. Capital, on the contrary, hires labor as cheaply as possible, and takes all profits to itself. The same principles of good management govern success in either system, a fact that has been overlooked quite generally by those who wish to reap the benefits of co-operation without sharing its responsibilities.

Past failures in associated effort have been due to the idea that co-operation was a departure that did not require attention to business principles. The public had imbibed this conception from the teachings of the earlier advocates, who enlarged upon the possibilities of co-operation, but whose want of experience in commerce or manufacturing led them to quite ignore the practical essentials upon which associated effort must be built up. This impractical idea still exists in many minds in spite of the lessons taught by the failures following the wave of co-operative enthusiasm that swept over the country in the early days of the Patrons of Husbandry or Sovereigns of Industry. Its latest manifestation is the serious consideration by the Kansas Farmers' Alliance of a vast scheme of co-operative stores under one central management, with a capital of $20,000,000!

The "solid" portion of every community, the men and women of some education and more common sense, understand the folly of such impractical theories, but at the same time grasp the possibilities of co-operative distribution and production when properly conducted. They are ready and anxious to take hold of it. They know those among their number who are competent to assume the management of a co-operative store, factory, fire insurance company, or bank, if begun in an humble way. It can then be enlarged as actual experience develops larger ability in the management and brings in profits with which to increase capital. The judgment of these sensible people, who so largely comprise the farming and producing public, to the effect that co-operation is the true way out of many of the evils that now beset them, has a solid foundation. A few of the many co-operative successes upon which it is based are worthy of note here.

Certain Western cattle-growers have an effective co-operative corporation, through which last year they marketed ten thousand carloads of livestock for over two and one-half million dollars, netting fifty per cent rebate on the commissions usually exacted by Stock Exchange brokers, after paying fifty per cent interest on the capital employed!

Co-operative banking and building associations are increasing at the rate of nearly five hundred per year, each with an ultimate capital of one million dollars. Their deposits about equal those of all national banks, while their assets are double the combined capital of our national banks. One farmers' bank alone has reduced interest rates in a whole State, and still has been able to return its farmer shareholders profits aggregating upward of seven hundred thousand dollars.

There are old-established co-operative stores doing trade to the amount of from fifty thousand to three hundred thousand dollars a year, and regulating if not controlling the business of whole States and cities, owned and operated by farmers and workingmen, and returning five to seventeen per cent dividend or rebate to purchasers after paying fair interest on capital.

Farmers' Exchanges market thousands of cars of produce for hundreds of thousands of dollars, securing better transportation, lower freights, better markets, and more prompt returns, at an actual net savings in the usual selling agents' commissions in one instance amounting to thirty thousand dollars a year, and in another case furnishing all the capital required for the Farmers' Exchange. In other words, the farmers get all these immense benefits, and at the middlemen's expense!

Butter and cheese factories almost without number are owned or operated more or less co-operatively, and the strictly co-operative creameries pay much better than proprietary factories. Co-operative associations are successfully solving the problem of how to give the producer a fair share of what city consumers pay for milk.

Farm mutuals or co-operative fire insurance companies in only ten States carry risks to the amount of six hundred and fifty millions of dollars, at a saving over the "regular" companies of one million a year.

With such a record, but faintly epitomized above, offsetting the failures that followed misguided co-operation, it is not surprising that the people generally and farmers in particular are ready to co-operate in earnest. Certain it is that by working together in this way they can themselves at once accomplish much that they now seek from the State, but which will take years to secure through the uncertainties of politics, and if obtained under such auspices may be conducted with less benefit than if run by private management.

Co-operation properly operated, not abused, will accomplish marvels for all classes, but more for farmers because their circumstances make them the best prey for the present evil system of distribution and production.

$500 for Drawings.

The art competition inaugurated by the AMERICAN AGRICULTURIST in its September issue, has already attracted much attention. It is an effort to bring out the best work of amateurs as well as professionals in art for use in these columns.

We hope that all who are gifted in drawing or in pen and ink work will enter the contest. It should be distinctly understood that any work submitted which does not secure a prize will be paid for at our regular rates if available for use in this magazine, while all drawings and sketches that do not secure prize money will be the property of competitors, subject to return to them.

It is true that many professional artists are doubtless planning to enter the contest, but we especially hope to bring out the work of many whose talents are not yet known. As explained in the original announcement in our September issue, the prizes are so arranged that the work of both classes of artists will be judged and paid for on its merits. The essential points of the rules appear on Page 585.

The pictures entered should reach the AMERICAN AGRICULTURIST by the 1st of December at latest.

Larger Markets Still.

The welcome news that Germany had removed her unjust prohibition of American pork imports has been the event of the month. The repeal of the prohibitory rule of 1883 also abolishes the restrictive regulations imposed by Germany in 1881 against our pork and other meat products.

This action has been imitated already by Denmark, from which market our pork has been excluded since 1888. France must follow this example, which will remove the objections that led the French Senate, three months ago, to defeat by a close vote the bill to admit American hog products. Italy and Austria-Hungary will be forced to do likewise.

The partisan controversy over the details of the imposts in the new customs act adopted by the United States Congress of 1891 has blinded the popular eye to certain features of the new law that commend themselves to all irrespective of differences of opinion upon the tariff. The portion of the measure referred to empowers the President to close our ports against the goods of any country that unjustly discriminates against United States produce, or to reimpose former duties on sugar, tea, coffee, hides, etc., coming from countries that do not afford reciprocal advantages to the United States. Moreover, the new meat and cattle inspection laws secured during the two past years have enabled our country, through its national Department of Agriculture, to guarantee the healthfulness of its cattle and meat exports. Indeed, the brand "U. S." is fast becoming recognized in the great markets of Europe as the highest standard of purity.

As the AMERICAN AGRICULTURIST'S cartoon

depicts, these two things give the United States government power to "put on the screws" to any nation that is not disposed to trade fairly with us. On the other hand, foreign nations can gracefully extricate themselves from the predicament of being forced or outwitted by American diplomacy on the plea that our new system of inspection removes their objections to American meats. Thus the dignity of nations is preserved, friendly relations advanced, and the famished peoples of Europe fed at reasonable cost with America's bountiful surplus!

The United States really has a magnificent supply of food products for export, of which Europe truly stands in great need. That the European deficit of rye and wheat is greater than for years is the most conservative statement of a condition that is creating profound anxiety at all continental centers of government. Yet the American farmer is not taking undue advantage of the misfortunes of our brethren across the seas. Instead of holding back his crops to extort famine prices, the wise farmer of our great wheat belt is shipping freely at prices that facilitate an active movement and quick returns. Indeed, the farmer's necessities compel him to market more freely than the situation warrants. He is needlessly sacrificing his corn, wheat and oats in not a few instances.

Higher prices may follow, but there is no disposition to kill the goose that lays the golden egg. Now speculators at home and abroad must be prevented from repeating the "corner" of a dozen years ago or so, which more than all else forced up prices of our produce in export markets and led Europe to seek other sources of supply. These gamblers in the necessities of life are a tax upon production and consumption that can no longer be tolerated.

In this connection, we advise a careful reading of the remarkable article by C. Wood Davis on this page. On the other hand, Beerbohm's estimate of September 12 places the world's shortage of wheat at sixty million bushels, whereas, the same authority a month earlier estimated this deficit at only sixteen million bushels.

The Exports of Breadstuffs.

The magnitude of the present export movement is shown by the fact that in the month of August, just closed, the United States exported 21,499,949 bushels of wheat and 839,795 barrels of flour. At four and one-half bushels of wheat as the equivalent of one barrel of flour, the flour export equals 3,779,077 bushels of wheat. This makes the total shipment of wheat in August 25,279,026 bushels, while in August last year we shipped only 9,500,000 bushels against 11,600,000 the year before, and about the same quantity in August, 1888. In fact, the United States exported the past August almost forty per cent of the quantity of wheat we shipped in the first eight months of last year following one of the largest wheat crops on record, and almost half as much as was exported in the first eight months of 1889. Such an enormous and unprecedented August export of wheat testifies to the shadow of famine that lowers over Europe, and to the fact that present prices of wheat are far below the natural value of the grain.

ISSUES OF THE DAY.

Are We to Have Famine Prices?

C. WOOD DAVIS.*

The extent of our wonderful crops is being exaggerated and the disaster which has befallen the crops of Europe belittled systematically by designing men. Their purpose is to hasten the marketing of our grain, so that the banker, transporter, warehouseman, broker, insurer and commission merchant may secure their tolls at the earliest possible day, regardless of the producer. All these parties seem a thousand times more solicitous that the grain should be hurried to market at a price that will benefit the European and middleman rather than the American farmer. In their present campaign for this purpose, they appear to have the help of leading political and trade journals. Their efforts are also effectually aided by the pressing necessities of the cultivators, who are forced to throw their grain upon the market, thereby producing a plethoric state, of which these "bears" are only too ready to take advantage. Hence the present and pressing necessity that the farmer and dealer in real products, as distinguished from the short-seller, should have the latest available information as to supplies and the prospective demand. The short-seller neither needs nor does he desire the truth regarding either the supplies or demand.

THE SHORTAGE IN GREAT BRITAIN.

The British Isles have been and still remain the greatest importers of bread-stuffs. During the last four years their wheat and rye crops have averaged about 80,000,000 bushels, the imports about 152,000,000 bushels, and the total average annual supply of the two bread-making grains 232,000,000 bushels.

The crop now being harvested has been subjected recently to all the unfavorable meteorological conditions possible. Fields that but a few weeks since promised above an average out-turn, are now so beset by mildew and other forms of blight that in many instances they will barely pay the cost of harvesting. So great has been this deterioration that the aggregate out-turn is not likely to exceed 64,000,000 bushels of wheat, and may fall as low as 60,000,000. In Ireland, where however but little wheat is grown, the Freeman's *Journal* of recent date reports the destruction of the crops to be so complete in some districts that the product will be fit only for litter, while the prospects are not much better in parts of Wales and Scotland.

With an out-turn of but 64,000,000 bushels, the stocks of old wheat in producers' hands 3,000,000 to 5,000,000 bushels below the average of recent years, the annual additions to the population augmenting the requirements by 2,000,000 bushels yearly, and "Dornbusch" reporting the stocks in British ports late in August as 4,300,000 bushels less than a year ago, it would appear that the United Kingdom would this year require imports of about 177,000,000 bushels to furnish the needed supplies. It is safe to say that an importation of 167,000,000 bushels, as indicated in a recent cablegram from the Liverpool *Corn Trade News*, is inevitable and one ten millions greater by no means improbable. If the condition of the potato crop is as bad as some of the more recent advices indicate, very material additions must be made to the estimate of the *News*. There remains hardly a doubt that the potato crop in Ireland is poor and there are not lacking indications that it will be a lamentable failure, with the possibility of a recurrence of the scenes of 1846.

A HEAVY DEFICIT IN FRANCE.

The thirty-eight millions of French people annually consume, for bread, seed and in the arts, about 416,000,000 bushels of wheat and rye (including a mixture of the two known as maslin). This is at the rate of nearly eleven bushels per capita, the rate for the eighth decade having been 10.97 bushels per capita. Both the wheat and rye crops of France were subjected to the rigors of the severest winter known since the second decade. The plant was destroyed upon more than three million acres that have been resown to crops other than wheat or rye. Such spring wheat as was sown has made but an ineffectual effort to contend against unfavorable climatic conditions. The wheat and rye area harvested in France is 20 per cent below the average of recent years. The yield of the area harvested does not exceed 70 per cent of an average, indicating an aggregate out-turn of wheat and rye (including mixtures of the grains) of 274,000,000 bushels. Such a result renders it necessary to either import 142,000,000 bushels or find some substitute therefor, if the usual volume of bread-stuffs is to be consumed. Owing to the destruction of the wheat and rye upon so large a part of the area, an unusual breadth was sown to barley and oats, and the yield being apparently good, unusual quantities of these grains may be used for food. The maize crop of Southern France is reported below the average, and therefore such substitution may no more than make good the deficient maize.

A recent issue of the *Le Mercuriale des Halles et Marches* places the out-turn of wheat in France at 188,000,000 bushels, or 150,000,000 below the crop of 1890, when the imports for the eleven months ending with June exceeded 37,000,000 bushels and were at the rate of 41,000,000 per annum. The aggregate supply of wheat for the year appears to have been some 379,000,000 bushels, to which should be added about 75,000,000 bushels of rye and maslin, making the entire apparent supply last year 454,000,000. Of this, however, about 9,000,000 was used in reseeding the devastated fields; some 20,000,000 bushels in replenishing the military reserves of the fortified towns, and no doubt another 9,000,000 bushels have been consumed while waiting for the produce of a very late and wet harvest to become fit for milling (and this same condition exists in Britain and over all Western Europe). Hence the immense quantity of wheat shipped from India and America in recent months has gone into consumption, and stocks in England are at a low ebb and those upon the Continent by no means burthensome.

THE GERMAN PROSPECT.

After Britain and France, Germany will be the greatest importer during the coming harvest year. Here the conditions are even worse than in France. The crops have not suffered greater destruction, but there is greater poverty in the industrial classes, and the more complete exhaustion of all reserves. A condition of distress, very nearly approaching famine, has existed over wide German areas since early in June, and probably longer, owing to lack of employment, the exhaustion of the supplies of home grown grain, and an increase in the consuming element rendering it necessary that the supplies of the bread-making grains should augment at the rate of more than 3,000,000 bushels yearly.

In Germany, the yield of wheat per acre may be put at 18 per cent below an average, indicating a loss from this source of 16,000,000 bushels. To this must be added a loss of some 10,000,000 to 14,000,000 bushels resulting from the destruction of the plant by frost upon fields that were replowed and sown to other crops (largely sugar beets). The wheat area has, in fact, suffered diminution in this way to the extent of nearly 20 per cent. The American commercial press and the trade journals, when dealing with this subject, conveniently ignore or are ignorant of the fact that the acreage of all Europe has been diminished in this way. They fail to recognize that estimates of yield sent out from Europe are for acreage yield, and refer only to the diminished acreage, mention rarely being made of the fact that the acreage to be harvested is from ten to twenty per cent less than was sown. Hence all these statements are misleading in the highest degree. This condition, as to the acreage to be harvested, probably accounts for such divergence as exists between the estimates of the writer and some others who are much relied upon.

In Austria-Hungary the same conditions exist as in Germany, only in lesser degree. Yet so great has been the destruction of the crops, especially that of rye, that net exports of wheat and rye

*This gentleman is a Kansas farmer, widely traveled and extensively read, also of large experience in business and railroading. He has made a special study of the food supply of the world. His article in the AMERICAN AGRICULTURIST for May last, on "The Farmer in the Impending Change," arrested national attention because of the clearness with which he pointed out the certainty of events that have since transpired. In this magazine for July, he answered certain critics regarding the "Permanency of Agricultural Production." In the above article he presents his reasons, revised to September 12, for believing that higher prices for cereals are inevitable Mr. Davis has sufficient confidence in his conclusions to hold until the spring of 1892 the crops grown on his own ranch this year—12,000 bushels of wheat and 30,000 bushels of corn.

averaging 16,000,000 bushels must be replaced by great imports, if the supplies are to equal those consumed in recent years. The Vienna Congress places the production of wheat and rye (from this harvest) in Austria-Hungary at 72,000,000 bushels less than in 1890, and the exports for that year being less than 18,000,000 bushels, it would appear that there should be considerable imports if the source existed. That extraneous supplies will be needed is rendered the more probable by the reported condition of the maize crop which, over the whole Danubian basin, has suffered greatly from midsummer drought as it has in Southern Russia and, to a lesser degree, in Italy. Hence Europe cannot substitute home-grown maize very largely for the deficient wheat and rye.

The potato crop of Austria-Hungary is affected by disease, but to what extent there is, as yet, no means of determining. That the potatoes of Germany, Holland and Belgium are seriously affected and will be but an indifferent or very meager crop is altogether probable. Should this crop continue to deteriorate, as it usually does when attacked by blight, the out-turn will be far below the average and greatly extend and intensify the distress already prevailing over wide areas—especially in Germany, where potatoes enter so largely into the subsistence of the poorer classes—and which is obscured, as far as possible, for political and economic reasons.

ONBY TWO-THIRDS OF A CROP IN CENTRAL AND SOUTHERN EUROPE.

The crops in Belgium and Holland are of much the same character as those of France and Germany, and there is much doubt if the out-turn will be two-thirds of an average. This will necessitate largely increased imports, especially in Belgium, where the per capita consumption of wheat and rye is about as great as in France—the greatest in the world.

In Scandinavia the crops are better than in other parts of Western Europe, but are still below the average, as are those of Spain and Portugal. Those of Portugal are better than those of Spain, the latter being reported to be 20 per cent below an average.

The Italian crops are somewhat better than was at one time promised, but the threshings are very unsatisfactory in many districts and imports will have to be increased as the indications are that the maize crop is below an average. The writer would put the Italian wheat and rye product ten per cent below an average, but the Vienna Congress makes it fifteen per cent below. In the latter case, were the maize crop a full one, the indicated imports of wheat and rye would be more than 40,000,000 bushels. My own estimate is that Italy will require 30,000,000 bushels of imported wheat and 8,000,000 bushels of imported rye.

Turkey proper and Greece seem to have fine crops, but neither produces sufficient for home consumption and their neighbors in the Danubian countries—Roumania and Bulgaria—while having produced crops of fine quality, have an out-turn below the average. It is as yet uncertain what will be the extent of their contributions to the needs of Western Europe.

But meager exports can be hoped for from North Africa, as the crops in Algeria and Morocco are very poor, while those of Tunis and Egypt are no more than sufficient to make good the probable deficit in Algeria and Morocco, leaving little grain to be sent to Europe.

As to the Asiatic dependencies of Turkey, the crops are good in Asia Minor and Mesopotamia, and very poor in Syria, the probabilities being that the usual exports will be made from this region as a whole.

Such have been the ravages of the locusts in the Central and Southern provinces of Persia that the Shah has been impelled to prohibit the exportation of grain from such districts. As they are the source of wheat exports it seems unlikely that Persia will send the usual 2,000,000 to 3,000,000 bushels of wheat to Europe.

INDIA AS A FACTOR.

The Indian crop was something above an average, and materially larger than that of last year, when exports reached about 27,000,000 bushels. As the present crop exceeds last year's by 20,000,000 bushels it would be reasonable to expect that the exports would be augmented in like measure. Already India has sent out 32,000,000, and may be confidently expected to send half as much more from the crop harvested in the spring of 1891. But a large part of the immense shipments already made from this crop have gone to supply the needs of the 1890-91 European cereal year, which ended with August. The crop which will be harvested in India in the spring of 1892 is but now being sown, so it is too early to forecast the contributions which Europe may expect from such source further than to say that the probabilities are in favor of an average yield and exportation. During the last five years Indian exports have averaged 33,000,000 bushels, of which about 30,000,000 reached Europe.

As yet all we know of the crops of South America and Australasia, which will be harvested in our midwinter, is that they have been sown and that the area in South Australia has been much diminished by the drought there prevailing at seeding time. *South American and Australasian exports, however, are of so little importance in the world's supply that combined they would no more than furnish Europe with bread for two days.*

THE RUSSIAN FAMINE NOT EXAGGERATED.

Heretofore Western Europe has depended largely upon supplies of wheat and rye drawn from Russia, but such has been the destruction of crops in that Empire that instead of furnishing any part of the supplies required it is by no means improbable that the Tzar may find it necessary to look abroad for the food required to keep life in his subjects. The Finance Minister, in a recent report, states that the Russian rye fields have this year produced 182,000,000 bushels less than is required at home for bread and seed. As Russian exports of wheat and rye have recently averaged 140,000,000 bushels per year, it would appear that even if the Russian wheat crop was an average one Russia would still have produced 42,000,000 bushels of the breadmaking grains less than required for domestic consumption. But there is little room to doubt that the wheat crop of Russia is at least 50,000,000, and probably 100,000,000 bushels below an average, as but a very limited number of the wheat districts have produced even two-thirds of a crop, and the great producing districts of Central and Eastern Russia have not returned the seed sown.

That the Russian rye crop is even more deficient than indicated by the Finance Minister is very probable. It is a well-established fact that famine exists in twenty-six Provinces, and has been rife in eighteen of the Central and Eastern Provinces for months—since February, if not December, in KaZan and Penza. It is also a very significant fact that these eighteen Provinces are the most populous as well as the most productive of the Empire. They include a very large part of the famous black-earth region, which may well be called the granary of all the Russias. The Kieff correspondent of the *Corn Trade News* (who is said to be a great grain merchant, and for whose statements that journal vouches in the strongest manner, after a careful personal survey of the distressed districts, states that there are eighteen Provinces where the harvest has given less grain than was sown, and that the people are living upon bark, grass, and berries in many instances.

THE PERILS OF STARVATION ALREADY THREATEN MILLIONS.

The startlingly significant fact, to which the commercial trade journals have failed to direct attention, is that this famine and that in Eastern Germany developed long before the harvest season. It was not due to the deficient crops of this year (although it continues to spread because of the deficient harvest), *but is the direct result of the exhaustion of the reserves which have heretofore supplemented current harvests that were insufficient for current needs, although above the average.*

That such is the actual condition of the world, as relates to its food supply, is made painfully manifest by these famines coming after the harvesting (in 1890) of one of the largest wheat crops the world has ever garnered, and a rye crop up to the average (that of Russia having been ninety-eight per cent of an average). Everywhere are the reserves of the breadmaking grains at a very low ebb. If such has been the outcome after and while consuming the great world's crop of 1890, when considerable reserves existed, and which were found necessary for the year's substance, what must be the result when the world's product is 600,000,000 bushels of wheat and rye below the quantity consumed last year? How can the world subsist from average crops when a crop 50,000,000 bushels above the average and supplemented by at least 50,000,000 of the remaining reserves is found to be insufficient, and the world's requirements are annually increasing 36,000,000 bushels per annum more than does the supplies from an increase of acreage? What price do such conditions indicate for the nearby years?

Outside of the famine-stricken districts, *which have not harvested as much grain as was sown*, Russia never has produced a surplus sufficient to subsist half of the 39,000,000 people inhabiting these provinces. Indeed, the average exports of the whole of Russia is equal to the subsistence, at the average rate of consumption obtaining in Europe, of but 20,000,000 people. Yet in the distressed provinces not only are the grain crops destroyed, but the hay and potato crops are equally bad. The pastures, too, are sere and bare, as they have been through the whole year, which accounts for the prohibition of the exportation of bran, as this food is required at home to keep life in the needed animals. The situation of Europe can best be shown by the following tabular statement:

EUROPEAN REQUIREMENTS AND PROBABLE SUPPLIES OF RYE AND WHEAT DURING THE 1891-92 CEREAL YEAR.

	Bushels.	*Bushels.*
Requirements for bread		2,400,000,000
Requirements for seed		300,000,000
Total requirement		2,700,000,000
Probable out-turn of European fields	1,800,000,000	
Seed required—a constant quantity	300,000,000	
Seven and one-half months' food supply	1,500,000,000	1,800,000,000
Deficit equal to 4½ months' food supply		900,000,000
America, India and all other countries can supply at outside		280,000,000
Ultimate European deficit equal to three months' needs		620,000,000

Potatoes and other substitutions may, possibly, be equal to half of one month's consumption, but this is not probable, as the potatoes are always consumed in addition to the wheat and rye; but, admitting that such substitutions will equal half a month's consumption, how are the other two and a half months to be covered?

THE SURPLUS FOR EXPORT.

The wheat and rye crops of the United States and Canada are, fortunately for Europe, most abundant, and it is probable that North America will contribute 180,000,000 bushels of the two grains to feed a hungry world. Of this 16,000,000 to 20,000,000 bushels will be required by the people of tropical countries and Eastern Asia. Europe's share will thus be some 160,000,000 bushels. With a possible 100,000,000 from India and all other sources, European requirements for the first nine months of the cereal year can be provided for. But to feed Europe for the other three months there seems to be only what maize the United States can spare, unless large quantities of the grains (oats, barley, etc.), usually devoted to the sustenance of animals and the manufacture of spirits and beer, shall be substituted for the lacking of wheat and rye. What will be the condition of Europe should our belated corn be nipped by September frosts?

Present conditions indicate a corn crop of about 1,800,000,000 bushels. We must not forget that the cribs are empty and that this crop must cover nearly or quite fourteen months' consumption, having now been in use in the Southern and Central districts, that were bare of corn in consequence of the deficit yield of 1890, a month or two earlier than usual. Such is also true as regards the oat crop of this year.

HIGHER PRICES MUST FOLLOW.

Owing to the necessities of a great number of farmers, wheat, oats and corn will move to market at an early day and in such volumes that, coupled with the market-wreckers' arts, the result will be prices below what would logically follow from the world's deficient supply. But once Europe has consumed a considerable part of its deficient crop, and we cease to market more than goes immediately into consumption, there will be such an uprush of prices as this generation has not witnessed.

Those who are looking for higher prices should not forget that the whole world is now employed in marketing the product of 280,000,000 acres of wheat and rye. No matter how meager the harvest may have been, the necessities of a vast number are such as to impel them to market their grain just as soon as it can be threshed. The grain thus over-marketed from American farms is now moving to the seaboard in a great swelling flood, which will probably be at its maximum in October

and from then until some weeks after New Year's day will slowly ebb. After that recession will be rapid, and as the tide ebbs so will rise the price of all kinds of grain and secondary food products.

When the marketing, now excessive, shall have so diminished that the amount going forward is somewhat less than current requirements, prices will advance "by leaps and bounds." Then the farmer, so fortunate as to have held a large part of this year's abundant yield, will secure an ample reward for his labor and expenditure. There can be no other result, as the world has grown but eighty-two per cent of the bread required.

After America, Asia, Africa and Australasia have sent Europe the last bushel of wheat that can be spared, there will be at least ten weeks for which no provision seems possible but a resort to American maize. Is it possible for us to spare enough of our Indian corn to furnish seventy European breakfasts; seventy dinners and seventy suppers? Let us not forget, when trying to solve this problem, that to properly set-out the European breakfast table requires the equivalent of 2,200,000 bushels of wheat and rye.

PUTTING ON THE SCREWS.

SECRETARY RUSK: "Our hogs are healthy and free from disease. Put the screws on, Mr. President, by shutting out German sugar from our markets if King William won't admit American pork."

Why the Farms Were Abandoned.

DUDLEY W. ADAMS, FLORIDA.

"National and not local taxation is the cause of Vermont's abandoned farms. With the proceeds of his products sold in the cheapest markets of the world, the Vermont farmer is unable to live and pay the exorbitant prices for farm machinery, clothing, and necessaries which have prevailed for the last quarter of a century." So writes J. E. Gale in the AMERICAN AGRICULTURIST for July. Evidently Mr. Gale is a young man not up in the history of prices, or an old man whose memory has played him a trick. Let me give him a few historic facts.

When Van Buren was President, over fifty years ago, and we had a low revenue tariff, I lived in Massachusetts on a farm. A hired girl worked for one dollar per week, and paid twenty-five cents per yard for imported calico. It took two weeks' work to buy a calico dress. To-day a girl for doing the same work gets $3.50, and can buy American print at six cents per yard One day's work will buy her a calico dress. On our farm, in 1840, we paid a hired man thirteen dollars per month. He bought at Levi Peck's store a suit of clothes and, as he expressed it, "paid twenty-eight dollars in warm cash," or over two months' work. To-day such a man would get twenty dollars per month, and can buy a better suit for fifteen dollars, or the price of three weeks' work. Then a pound of butter would bring twelve to sixteen cents, and it would buy a yard of sheeting. Now a pound of butter will on an average buy two to three yards of the same goods. Then any respectable imported broadcloth cost $2.50 to $3.00 per yard. To-day one can buy as good American made for $1.50. When Van Buren was President a scythe cost $1.25; it came from the store rough and unground, and it took from half a day to a whole day to grind it.

Two decades later I was in the West, during James Buchanan's low-tariff times. A two-horse reaper cost $150, and eggs were four cents per dozen. To-day the Western farmer can buy a better machine for $75, and sell his eggs at eight cents per dozen. Rakes, forks, seeders, harrows, plows, and all farm machinery are correspondingly cheap. Clothing, tea, sugar, crockery, clocks, calico, flannel, domestic wares of all kinds, are much cheaper than at that time.

It is a profound mystery to me why Mr. Gale and his Vermont farmers continue to sell their products in the "cheapest market in the world." The ocean and land are covered with more, and better, and swifter means of transportation than ever before. The simple fact is that all nations consider America the best market in the world, and are nearly frantic whenever our government puts up the bars and says: "This unequaled market is for goods made and products grown by Americans. If you want to bring your stuff here and take the benefit of our superior markets, and thus displace home products, you must pay for the privilege." Vermont farmers sell nine-tenths of their products in America because it is the market that will pay them the most net money for them. No, the reason Vermont farms are deserted is because the Vermont farmers of to-day are not willing to work for the same pay and live as of yore.

THE CROPS OF THE UNITED STATES.

The Condition and Acreage of the Staple Crops at Harvest.

[Compiled by the AMERICAN AGRICULTURIST from the returns of the United States Department of Agriculture.]

The main facts about the crops of 1891 are in the following table, compressed into small compass for ease of comparison and reference, by States and for the country at large. The condition of each crop on the first of September, or at harvest, if gathered before that date, is given on the basis of 100, representing a full average stand in every respect. The acreage of each crop is also returned, 100 in this case representing the breadth devoted to the crop last year (1890). The table also gives total area of all cultivated crops, the area of land mowed for hay (mowings), and the condition of pastures August 1. The asterisks against the wheat acreage indicate the spring wheat States; all the other States are placed in the winter wheat class.

	CORN.		WHEAT.		RYE.		OATS.		BARLEY.		BUCK-WHEAT.		BEANS.		POTATOES.		SWEET POTATOES.	TOBACCO		COTTON.		SORGHUM.		SUGAR CANE.	ALL CROPS.		CLOVER.	TIMOTHY.	MOWINGS.	PASTURE.	APPLES.	GRAPES.
	Condition.	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Acreage.*	*Condition.*	*Total Area.*	*Product.*	*Condition.*	*Area.*	*Condition.*	*Condition.*	*Condition.*	*Condition.*
Maine	97	106	99	102*	99	100	100	105	99	101	99	104	96	101	96	105	...	...	...	...	...	...	...	...	103	93	96	99	100	73	91
New Hampshire	95	109	99	101*	99	100	100	100	98	99	98	100	95	99	98	103	...	...	...	...	...	...	...	...	104	91	91	99	98	70	90
Vermont	96	105	100	101*	98	100	100	101	100	102	99	100	97	101	100	103	...	...	...	...	...	...	...	...	103	95	96	100	99	77	89
Massachusetts	98	107	000	99*	98	99	100	100	97	100	99	101	98	103	97	105	...	...	102	...	...	...	...	...	104	82	86	99	100	71	93
Rhode Island	96	106	000	...	98	...	96	103	93	100	99	...	98	100	95	102	...	...	...	...	...	...	...	...	104	83	85	98	80	87	95
Connecticut	98	104	97	98	98	100	95	98	98	98	98	105	92	105	93	103	...	99	101	...	...	...	...	...	103	75	90	98	80	80	95
New York	92	106	99	100	98	99	96	105	92	102	100	101	96	102	97	103	...	99	102	...	...	...	...	...	101	74	82	100	88	76	85
New Jersey	98	101	96	100	96	100	87	98	92	...	93	102	87	98	96	104	94	...	...	...	...	...	...	...	102	70	77	99	81	96	89
Pennsylvania	98	101	99	100	98	100	90	97	90	100	97	101	96	98	92	103	93	98	106	...	...	84	88	...	102	89	90	99	92	80	80
Delaware	90	102	96	103	98	101	98	105	93	...	97	100	100	100	94	104	100	...	...	...	...	100	100	...	100	89	94	100	100	97	94
Maryland	95	102	97	101	95	98	87	99	98	103	98	100	93	95	95	103	95	87	80	...	...	...	...	...	103	85	88	102	98	97	81
Virginia	95	101	95	100	88	97	72	92	96	100	97	99	92	96	92	103	93	89	99	78	96	93	92	...	100	77	86	102	98	85	73
North Carolina	95	100	84	102	84	99	82	97	...	...	85	102	91	98	90	99	92	86	101	79	94	95	94	...	101	93	93	104	99	75	79
South Carolina	98	102	83	101	90	105	85	98	...	...	...	105	90	97	97	103	99	...	...	81	96	98	95	100	101	89	95	102	100	78	96
Georgia	97	104	92	90	93	99	76	96	...	100	...	...	94	97	89	104	97	...	...	82	95	99	93	97	101	90	92	103	96	71	94
Florida	95	101	...	...	...	...	95	98	...	...	...	...	87	91	85	104	94	...	...	88	99	98	100	97	102	100	....	100	96	70	80
Alabama	99	102	91	96	91	100	78	97	...	101	...	...	92	101	89	99	90	...	...	83	96	93	92	89	101	87	90	102	94	71	91
Mississippi	99	103	90	102	95	101	77	95	...	...	...	...	80	111	91	99	90	...	...	83	95	98	84	90	101	92	92	102	97	72	88
Louisiana	93	102	...	...	...	...	84	98	...	...	...	...	87	90	89	103	88	...	...	85	96	95	101	90	102	85	90	102	97	74	83
Texas	92	112	97	105	94	102	97	110	...	105	...	...	95	100	93	104	82	...	...	82	105	89	103	88	105	97	95	103	92	77	90
Arkansas	99	106	98	102	97	101	90	102	95	...	...	...	100	99	95	103	98	96	102	86	96	101	93	97	101	97	98	102	99	83	88
Tennessee	98	101	98	101	96	95	70	90	...	98	90	...	94	94	84	100	92	88	105	84	95	97	95	...	101	81	85	101	93	72	85
West Virginia	99	101	98	101	96	100	80	97	88	...	98	101	99	100	95	103	97	96	100	...	...	98	94	...	105	81	87	102	99	82	65
Kentucky	97	103	97	102	95	96	67	80	90	100	95	100	99	96	96	101	94	84	105	...	...	96	94	...	100	90	87	102	90	83	82
Ohio	95	101	98	102	97	120	88	95	93	110	89	...	92	95	95	102	93	90	97	...	...	91	88	...	101	87	93	100	95	58	50
Michigan	80	100	98	104	92	99	90	99	94	103	85	100	95	99	88	103	...	...	...	...	...	...	83	...	101	65	75	104	70	45	74
Indiana	90	101	100	104	100	105	82	90	84	105	86	99	95	99	88	102	90	89	95	...	...	87	96	...	101	90	92	100	84	80	78
Illinois	88	108	100	120	98	101	92	93	93	120	85	99	98	98	90	102	93	88	000	...	...	90	94	...	102	92	92	99	85	73	91
Wisconsin	80	101	90	98*	86	98	90	99	92	105	75	101	92	99	93	102	...	91	140	...	...	74	94	...	103	66	72	102	78	70	80
Minnesota	82	102	100	103*	98	110	99	102	85	104	88	98	92	97	97	102	...	...	...	...	...	73	91	...	104	86	91	103	92	78	90
Iowa	90	103	99	101*	98	98	99	100	99	102	95	102	96	100	100	101	95	93	...	...	...	93	96	...	103	97	95	99	100	94	89
Missouri	88	99	94	130	92	100	76	85	96	101	90	100	94	94	97	102	94	82	102	...	...	88	92	...	101	100	100	102	100	74	88
Kansas	82	183	89	150	94	106	83	95	70	135	90	100	95	100	95	98	90	...	...	...	...	98	92	...	101	100	100	102	100	89	91
Nebraska	89	130	98	105*	97	120	94	120	95	105	97	100	99	96	96	102	98	...	...	...	...	98	94	...	99	100	100	101	100	98	96
California	88	101	98	120	98	102	99	106	95	120	92	100	99	100	97	104	98	...	...	...	...	...	...	...	105	98	99	101	93	95	99
Oregon	98	102	97	110	91	103	99	105	98	101	95	...	96	104	97	105	...	...	...	...	...	92	102	...	104	100	100	103	100	95	100
Nevada	85	...	98	110*	...	...	95	105	99	107	...	100	...	...	84	100	...	...	...	...	...	...	...	...	102	92	96	103	100	100	....
Colorado	93	103	99	105*	97	105	96	109	97	102	...	...	97	114	95	107	...	...	...	...	...	90	112	...	110	100	99	104	100	92	95
Arizona	88	105	97	105*	...	...	95	...	98	100	...	...	86	90	77	104	...	...	...	...	...	90	...	...	102	....	90	105	....	100	90
North Dakota	87	110	94	104*	...	100	95	105	90	101	...	...	...	86	97	104	...	...	...	...	...	...	...	...	110	100	98	105	100	....	....
South Dakota	82	110	99	104*	90	100	95	105	98	101	...	98	95	...	98	105	...	...	...	...	...	...	...	...	110	99	98	105	100	95	94
Idaho	86	...	99	109*	...	...	93	104	98	103	...	90	100	100	99	103	...	...	...	...	...	91	85	...	....	....	97	.....	....	100	100
Montana	85	110	99	...	...	...	95	105	97	100	...	...	98	120	99	105	...	...	...	...	...	100	...	...	110	100	99	106	100	99	....
New Mexico	82	102	96	...	...	...	80	100	97	100	...	...	100	99	..	101	...	...	...	...	...	50	100	...	105	97	95	105	100	90	93
Utah	96	101	98	95	95	98	97	103	...	102	...	...	...	120	96	103	...	...	...	...	...	91	92	...	102	97	99	101	95	95	93
Washington	98	102	93	90	90	110	89	103	98	100	...	...	...	...	95	107	...	...	...	...	...	...	...	...	112	100	97	110	96	82	98
Wyoming	...	...	...	...	...	...	...	...	86	...	...	...	...	94	...	104	...	...	...	...	...	...	...	...	....	98	100	105	100	....	....
General Average	91.1	108.3	96.9	108.2	95.1	101.5	90.7	97.9	94.3	107.1	96.6	100.9	*94.5	94.6	94.8	102.3	89.9	87.4	102.6	82.7	97.7	91.4	92.1	....	1028	88.1	90.9	101.8	92.2	82.6	87.3
" " 1890	70.1	100.7	75.5	96.5	85.4	98.5	64.4	98.7	78.6	98.4	90.5	101.9	96.9	99.2	65.7	100.2	83.3	82.4	103.8	85.5	102.8	83.1	99.2	....	....	91.1	93.6	.....	.....	.....	72
" " 1889	90.9	103.5	87.5	102.1	91.6	99.9	90.0	102.7	88.9	96.5	92.1	.....	72.1	...	81.7	.....	93.6	76.2	....	86.6	.....	90.3	.....	....	....	96.3	94.5	.....	.....	69.4	81.2
" " 1888	94.2	104.2	77.3	95.2	92.8	99.9	87.2	104.8	86.9	99.8	93.7	92.5	93.8	100	91.6	104.6	92.1	87.0	119	83.8	102.2	91.4	97	....	....	91.3	....	.....	.....	78.8	89
" " 1887	72.3	101.7	82.0	101.3	82.2	93.2	83.4	104.1	83.0	103.1	89.1	99.2	95.4	102.9	67.3	102.7	86.5	70.8	82.5	82.8	101.0	86.9	97.7	....	....	99.7	80.6	.....	.....	56.2	94.4
" " 1886	76.6	103.5	87.8	100.0	93.4	94.4	90.9	102.4	92.7	103.1	89.8	98.9	99.2	98.1	81.4	104.3	89.7	81.2	96.1	82.1	101.4	87.8	91.8	....	....	99.7	....	.....	.....	78.2	88.6

A Splendid Wheat Yield.—The condition of wheat is very high, considering both winter and spring varieties, in soils, latitudes, and elevations so widely differing. The general average has only been exceeded slightly twice since 1879—in 1882 and 1884. State averages are quite uniform, but ten falling below ninety-five and three below ninety, the lowest being eighty-three for South Carolina and eighty-four for North Carolina. The figures as to condition for all the States appear in the table above, with interesting comparisons.

In the Middle States wheat was generally well filled, harvested in good condition, yielding well in threshing. In a few counties in Pennsylvania, and in parts of Maryland and Virginia, there has been some injury in the shock. The Texas crop was unusually fine, harvested in May and June, and is now mostly marketed. In one county a yield of twenty to twenty-three bushels per acre is reported, and in another eighteen bushels. A reporter in Kentucky claims for wheat "one of those exceptionally fine crops that occur only at long intervals"; others make less sanguine statements. With variable returns in Ohio and Michigan, the tenor of remark as to quality, quantity, and condition is very favorable. In Indiana and Illinois, Missouri and Kansas threshing gave yields better than was expected, with some exceptions "the largest ever harvested" in one instance; "thirty-eight bushels per acre" in another, and estimated average weights of sixty to sixty-two pounds in most favored localities. Some shriveled grain is reported, and some damage in the shock.

The remarks concerning quantity and quality of spring wheat in Minnesota are extremely favorable, with very slight drawbacks from frost and wet, and nearly as favorable in Iowa, Nebraska, and the Dakotas. Extreme yields of thirty to forty bushels are reported in all these States. The spring wheat of the Pacific coast has been somewhat injured by hot and blighting weather.

The Condition of Corn is twenty-one points higher than in September of last year, and has been exceeded only three times in the past ten years. State averages are generally high; the lowest are those of Michigan and Wisconsin, Minnesota and North Dakota coming next, while South Dakota, Nebraska, and Kansas make figures under the general average. In the Eastern and Middle States the crop is well grown, is generally earing well, but a little late, and recent cool nights prevent rapid advancement, yet frost has as yet done no damage. The crop is in fine condition in the Southern States. It is not so much injured by heavy rains as cotton. In some bottom lands water has caused material injury, while on uplands the crop is remarkably good. It was somewhat late, but is now generally beyond the reach of frost. A fine yield has been made west of the Mississippi, though in Western Texas a little reduced by drought. It is a crop decidedly above medium throughout the South as a whole. Many correspondents refer to it as the best in years.

In the Ohio Valley corn is heavy in stalk, somewhat late in earing from cool nights, in some places has been blown down by heavy winds, yet is generally very promising. Local droughts are mentioned at a few points as cause of deterioration, without producing very serious loss. The correspondent in Franklin Co., Ohio, claims the heaviest crop in forty years. In Indiana and Illinois there was more injury from drought in July and early in August, which has been partially repaired by recent rains. If frost holds off ten days nothing but the latest planting can be injured. Absolute immunity from loss would require exemption through September, yet most of the breadth is already safe. In Michigan there has been considerable injury from frost in late-planted fields. Wisconsin reports damage from frosts of August 22-28, and in some cases still earlier. Some areas have been cut up for fodder in this latitude. Many Minnesota correspondents promise a good crop "if frost holds off," while in valley lands and the more northern sections it has already done considerable damage. There are also returns of injury from frost in the Dakotas. In Iowa and Nebraska the crop is late, and would be injured by frost prior to September 20, and needs the entire

(*Continued on Page* 578).

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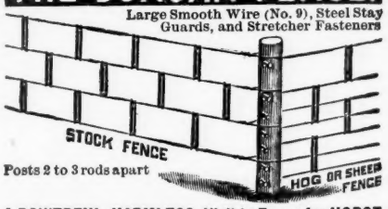

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CROPS OF THE UNITED STATES.

(*Continued from Page* 576).

month for the ripening of late-planted areas. In Missouri heavy rains in June, drought in July, and heavy rain and wind storms recently have been unfavorable to highest condition. On well-cultivated and drained areas corn is very heavy. Condition is variable in Kansas, the Western district suffering from drought, while Eastern counties have abundant moisture and a heavy crop.

This summary is sent out by the Department of Agriculture September 10, but up to the hour of going to press, on the 15th, no further serious injury from frost is reported. Only biting frosts within the last two weeks of September would materially lessen the AMERICAN AGRICULTURIST estimate (see Page 522) of a two-billion-bushel crop. Evidently the frost in the Northwest has already been hard enough to make an extra lot of soft corn. The acres in corn this year are placed at 78,900,000, against 78,319,651 in the great corn year of 1889. The general average condition this September 1 is 91.1, against 90.9 at the same date in 1889. The early frosts must reduce October 1 condition to 90 or below, against 91.7 at that date two years ago.

Since our last issue Secretary Rusk has dispatched a commissioner to Germany to introduce our maize in the German army. The foreign shortage of rye and wheat promises to make an unprecedented export demand for our maize, and must have a great influence in maintaining prices.

The New Crop Movement.—Receipts of wheat at Kansas City, Chicago, and New York during the six weeks ended September 15 were several times larger than in the same period of any previous year. Exports too are unprecedented, having been over 1,000,000 bushels a day from Atlantic coast ports alone for several consecutive days in August. The foreign market is crazy to buy our wheat at present prices, fearing the higher values that the future is believed to have in store. On the whole, therefore, the AMERICAN AGRICULTURIST prediction of dollar wheat to the farmer with a crop exceeding 500,000,000 bushels does not seem far out of the way. Many farmers and dealers agree with C. Wood Davis that wheat will go to $1.50 at Chicago by spring. The unprecedented foreign demand is abundantly proven by present exports. Only a foreign shortage quite as serious as has been feared could have maintained prices at Chicago as they have kept up during the month ended September 15, in the face of such enormous receipts. Prices weakened under the strain, and will be forced still lower if what the Minnesota Farmers' Alliance calls the "insane rush of wheat to market" is not stopped. The AMERICAN AGRICULTURIST, with the conservatism of fifty years, does not quite indorse the extreme "bull" view of the future taken by Mr. Davis, but it freely warns its readers against an undue rush of crops to market. The AMERICAN AGRICULTURIST sees no reason to doubt a steady improvement in prices if crops are marketed with any reason. We hope American farmers will neither sacrifice their produce nor check trade by holding for exorbitant prices. A mean between the two is desirable and will line our farmers' pockets with gold.

A Small Cotton Crop.—The September report of the Department of Agriculture marks a reduction in condition of cotton during the past month of six points, from 88.9 to 82.7. August is a critical period in the growth of the cotton plant, and sixteen times in twenty years has deterioration been indicated by the returns of September 1. In the four exceptional years the August averages were relatively low, and a decline had occurred during the previous month. The cause of the present reduction, on the Atlantic coast, has been an excess of rainfall, causing overgrowth of the plant and diminishing the tendency to fruitage. From Alabama westward drought was the main factor of loss, assisted by the boll worm and caterpillar. Condition is lowest in Arkansas, Louisiana, and Tennessee. In a few counties of Texas heavy rainfall in the morning, followed by hot sunshine in the afternoon, caused serious shedding of forms.

The most serious complaints are of shedding fruit and leaves, rotting of bolls, sprouting of seed in the bolls, rust, staining of open cotton, except in a few localities where cotton worms are unusually destructive. In the areas affected by drought, rust and shedding also occur. Sudden extremes of temperature, cool nights followed by hot days, have been productive of similar indications of deterioration. Any cause reducing vitality and threatening decay produces these frequently-indicated diseases and conditions. The relative degree of loss from these causes is indicated by the State averages of condition, which are as follows, compared with September 1 of last year:

The 1890 crop movement for the year ended Aug. 31, 1891, was 8,655,518 bales. As the previous crop was all out of planters' hands, while quite a little of the '90 crop is still believed to be back in the country and not "in sight," it is coming to be believed that the United States actually produced very near to 9,000,000 bales of cotton last year. Hence, the Department's return of condition in September 1, last year should really have been 100. Its returns this season are based on a comparison with last year, and therefore warrant expectations of a crop of between 7¼ to 7½ million bales, in view of the reduced acreage. That the market accepts this view is evident from the late advance in prices. The export movement has been enormous, 5,834,848 bales having been sent out of the United States during the year ended Aug. 31, '91, against 4,987,898 bales in the last trade year.

	Sept. 1, Condition.			*Acreage, per cent.*		
	'91	'90	'89	'91	'90	'89
Virginia	78	93	62	96	98	101
North Carolina	79	95	79	94	102	99
South Carolina	81	87	87	96	103	99
Georgia	82	86	90	95	102	98
Florida	88	90	94	99	103	100
Alabama	83	84	91	96	102	98
Mississippi	83	87	88	95	102	102
Louisiana	85	93	91	96	95	103
Texas	82	77	81	105	105	103.5
Arkansas	86	89	90	96	99	104
Tennessee	84	94	84	95	100	100
General Average	82.7	85.5	86.6	97.7	102	101

The crop movement of 1890 was 8,655,518 bales.
" " " of 1889 was 7,313,926 "
" " " of 1888 was 6,935,082 "

Small Grain will yield well. There will be full crops of rye and buckwheat, but more barley than usual owing to the increased breadth sown.

Hops and Tobacco.—The only comprehensive report of the cigar leaf tobacco crop is furnished by the New England *Homestead*, Springfield, Mass. From its annual review in the issue of September 5, it appears that this crop was grown on 91,967 acres against 83,960 last year, and 79,522 acres in 1889. The total production is placed at 225,000 cases this year against 195,000 and 172,000 cases respectively in the two previous years. In spite of the large crop which has been harvested in excellent condition in Pennsylvania, New York and New England, but is late in Wisconsin and Ohio, the market is very active at advanced prices. Many sales of leaf of this year's crop have been made in New England for from fifteen to thirty cents per pound, the leaf to be delivered cured and in prime condition. The prices thus far paid are thirty-seven per cent higher than the average paid for the last crop.

Hops are yielding quite heavily both in this country and Europe, and are being contracted for at twelve and one-half to eighteen cents per pound in Central New York and on the Pacific coast. The authority just quoted thinks this price is lower than the conditions warrant.

The Onion Crop in the sections where it is commercially grown is believed to be about the same as last year. The heavy increase in acreage more than offsets the shortage in Western New York and Ohio, and the crop is abundant also on the Pacific coast, where it is selling for forty cents per bushel, against fifty cents as the average price in the New York onion fields. Many of the later planted pieces in the Eastern States have blighted.

Potatoes.—The returns for this crop have been remarkably uniform throughout the season, showing that with exceptions very local in character, the year has been a favorable one. The present average is 94.8, or less than one point below that for July. Last year there was a decline of 26 points during the same period. There are, however, indications that September is likely to develop considerable damage from blight and rot which have appeared in many portions of New England and the Middle States. Should the present month be favorable to the propagation of these diseases the crop is liable to serious injury in the East, but present indications all point to a large yield in the West.

Hogs Will be Higher, mainly because of their lessened number following the short corn crop of 1890. The great export call for corn and pork products will also help. The number of stock hogs for fattening is this fall only 93.6 per cent of that number available on September first last year. The number at the same date in 1890 was 97.3, and for the four preceding years was respectively 101, 95.7, 87 and 93.7. Hogs are in good average condition, and with a big corn crop there should be a big outpost of pork at prices that will be high compared to the low values of the years just passed.

New Markets for Fruits and Vegetables.

Among American exports which will be benefited by the reciprocity treaties fruits, vegetables, and garden products generally, form a large class. In Cuba and Porto Rico fresh fruit like apples and pears was taxed $2.41 a barrel before the recent increase of twenty per cent on all importations. Preserved fruits and sweetmeats have been subject to a duty of $1.72 per 220 pounds. Under the new treaty all fruits, whether fresh, dried or preserved, will be free. In San Domingo, under the reciprocity convention, both fruits and vegetables, whether fresh, canned, dried or preserved, are to be admitted with a reduction of twenty-five per cent in duties which were formerly prohibitory.

In the convention with Brazil no provision is made for the admission of fresh fruit, but there is a reduction of twenty-five per cent in the duties on canned and preserved fruits and vegetables. In Cuba the duties before the recent increase of twenty per cent ranged from $6 to $12 per 220 pounds on pickled and canned vegetables. Under the treaty fresh and dried vegetables will be free, and sauces, pickles, jams and jellies, and under a liberal construction of the schedules canned vegetables as well, will be subject to duties reduced fifty per cent.

At first sight it would seem like carrying coals to Newcastle to take fruit to tropical countries. The Southern markets are abundantly supplied with their own fruit. Brazil has Bahia oranges, the finest to be found south of Florida; pineapples that are unrivaled in the tropics, and mangoes, bananas and other fruits of the equatorial zone in profusion. In Cuba tropical fruit of all kinds is cheap and of fine quality, and the very heavens seemed to rain guava jelly on the just and the unjust. In both countries the abundance of these fruits cloys the appetite. It is a common saying in both the West Indies and Central America that "bananas are good for hogs and Americans," and certainly the natives eat them sparingly. Oranges, pineapples and mangoes are the favorite fruits, but apples, peaches and pears from the temperate zone are considered more delicious and always command high prices.

Two years ago an American ship entered the harbor of Rio with a large cargo of New England apples. The captain, who owned the vessel, had taken down the apples at a venture, hardly knowing whether he could dispose of them or not, but he sold them readily for $11 a barrel and made so handsome a profit that he hastened North for a second shipload.

There ought to be a large development of the trade in Northern fruits as the result of reciprocity, and especially in canned and preserved fruits. Brazilians and Cubans, like all Southern races, are excessively fond of sweetmeats and preserves, and they have few of their own. An American merchant in Para, at the mouth of the Amazon, attempting to supply the demands of this trade, ordered as an experiment a consignment of American preserves from a New York wholesale house. The goods sent out were subject to extra duties on account of the thickness of the tins, but were highly relished by those who tried them. There was only one cause for complaint. In the hot climate of Para the preserves were invariably spoiled when once opened and the boxes or tins were so large that there was much waste. The merchant wrote to the New York shipper that the sweetmeats had made a great hit and that all his customers wanted more of them; but that smaller and thinner cans were necessary. Special pains were taken with the consignment, the tins were right and the preserves had a rapid sale. A larger order was sent for a third shipment, but when it was received in the North there were no tins of the right kind and the goods were put up in large, heavy boxes. The increase of duties raised the price and every customer complained of the waste.

(*Continued on Page* 582).

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HORSE BLANKETS

Nearly every pattern of 5/A *Horse Blanket* is imitated in color and style. In most cases the imitation looks just as good as the genuine, but it hasn't the warp threads, and so lacks strength, and while it sells for only a little less than the genuine it isn't worth one-half as much. The fact that 5/A *Horse Blankets* are copied is strong evidence that they are THE STANDARD, and every buyer should see that the 5/A trade mark is sewed on the inside of the Blanket.

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Is absolutely pure and it is soluble.

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PAINLESS—EFFECTUAL
FOR
BILIOUS & NERVOUS DISORDERS,

Such as Sick Headache, Wind and Pain in the Stomach, Giddiness, Fullness, Swelling after Meals, Dizziness, Drowsiness, Chills, Flushings of Heat, Loss of Appetite, Shortness of Breath, Costiveness, Scurvy, Blotches on the Skin, Disturbed Sleep, Frightful Dreams and all Nervous and Trembling Sensations. Every sufferer is urged to try one box.

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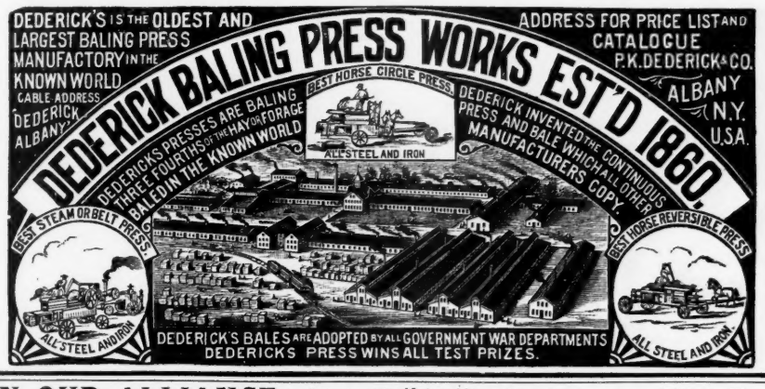

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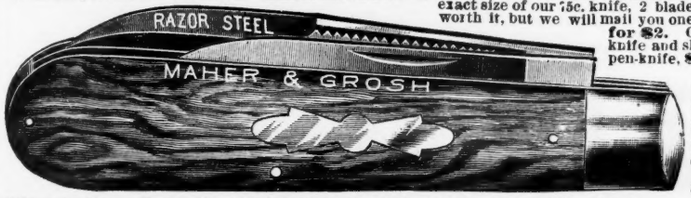

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Smith & Pomeroy, Kalamazoo, Mich.

Also Manufacturers of
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Self-adjusting boxes, dust proof oil cups heavy steel shafts, perfect automatic speed governor, light running. Ample room for largest horses. Can belt backwards or forwards. The **best power** for running our **American & Hero Grinding Mills, Hero Ensilage & Fodder Cutters, Chief Self-Feed Corn Sheller, Wood Saws, Drag Saws, Peck's Husking & Shelling Attachment, etc.** We also have the

BEST LEVEL TREAD POWER MADE.

It will pay you to send for our handsome Illustrated Catalogue and reduced prices of these celebrated goods.
APPLETON MANUFACTURING CO., 19 So. Canal St., CHICAGO, ILL.

A SOLID STEEL FENCE.

This is Not Wire.

CUT FROM Steel Plates

MADE OF **EXPANDED METAL.**

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Write for Illustrated Catalogue. No. 13. **CENTRAL EXPANDED METAL CO.**
Hardware Men keep it. Give name of this paper. **116 Water St., Pittsburgh, Pa.**

DECORAH STEEL WINDMILL
and STEEL TOWER.

The Decorah Steel Windmill has the most powerful movement ever employed in a windmill; lifts the pump rod with equal ease at all parts of the stroke; the line of draft in lifting is kept directly over the center of the lifting shaft; the coil spring governor is the most perfect of windmill regulators; **THE WHEEL AND VANE ARE MADE ENTIRELY OF STEEL.**

We guarantee our eight foot mill to do the work of any ordinary ten foot mill

Is half the weight, costs you half the freight, and a much less expensive tower to carry it; has no crank or wrist pin, with their leverage to act against the wheel. No pitman. No dead center.

Will Run a Pump in a Lighter Wind Than Any Other Wind Mill On Earth.

"The World Do Move" See what we have to interest you before making contracts for any old time windmills.

GOULDS & CALDWELL CO., Mfrs. 22 & 24 N. Canal St. Chicago, Ill.

MATTERS OF BUSINESS.

Western New York Crops.

Nature has been very kind to us this season. Our efforts last year had remained "fruitless" in many respects. The second complete failure of the apple crop—a leading one in Western New York, and the shortage in potatoes, pickles, and other vegetables and fruits, had just begun to make us real raving mad, and feel inclined to either give up in despair or to spill Bordeaux mixture and ammoniacal carbonate of copper solutions in streams, when Nature, all at once, and without apparent effort wiped out our multitudinous enemies—the apple scab, pear blights, plum-leaf fungus, grape mildew and rot, also the codlin moth curculio, potato beetle, striped cucumber beetle, squash bug, etc. In fact, there is hardly an enemy, either in the shape of fungus or insect, left to tell the story. In one sense this is unfortunate. It will serve to put us again at our ease and make us neglectful. It is not likely that our enemies have said goodby forever. They will return, but it may take a long period of tribulation and loss, hereafter, before we will be roused again, and recognize the necessity, as all should, of spraying our crops with fungicides to prevent loss.

We are not yet out of the woods, however. I notice signs of blight in some potato patches. The crop hereabouts is not especially promising; most of it planted late, and seed cut very close on account of its scarcity, and the almost unparalleled high price this spring. Dry weather and single-eye planting do not seem to go well together. Large-seed pieces, planted early in the season and in rich ground, have made very fine growth, and apparently were not hurt much by the long, dry spell in May and June. The Bordeaux mixture is used as a preventive of potato blight.

While apple foliage is perfectly healthy, and growth magnificent, the fruit is largely missing. Baldwins—the leading market apple here—are very scarce, most trees not having a specimen to show the variety, Greenings hang quite full. I doubt whether there is a more profitable apple for Western New York than the Greening. The young orchards now in their prime consist mainly of Baldwins, as a result of the cry some years ago for red apples, and the consequent better prices obtained for Baldwins. The growers made a big mistake, and they see it now. The Greening is by far the surest cropper and a much heavier yielder. This season's apple crop is estimated, by careful growers, to be from one-tenth to one-quarter of a crop. I believe we shall come near the latter estimate—but the crop will certainly be small, and apples will not be plentiful this fall, unless I am deceived by reports from elsewhere.

T. GREINER, Niagara Co., N. Y.

News Notes and Commendation.

Watermelons in England.—A recent shipment of Georgia watermelons to Liverpool, Eng., is reported to have been sold at seventy-five cents each melon. This seems to promise a fine market for an important Southern crop.

A Salary with expenses paid will come handy to any one who is now out of employment; especially where no previous experience is required to get the position. If you want a position, see advertisement on page 583, "A Chance to Make Money."

Reliable Scales at Low Prices.—We are glad to learn that the United States Standard Scales, manufactured by Osgood & Thompson at the Binghamton Scales Works, Binghamton, N. Y., are rapidly making for themselves an enviable reputation wherever they are known. The manufacturers will be pleased to send their catalogue free to all applicants.

A Harmless and Effectual Remedy.—The truth of the old proverb, "An Ounce of Prevention is worth a Pound of Cure," is forcibly exemplified in Beecham's pills. These pills, if judiciously used, are actually preventives of a great many ills which flesh is heir to. They cost only twenty-five cents a box, and no one who has once learned their value pecuniarily, as well as physically, will be without them.

For a long time the use of coffee and tea threw the habit of cocoa drinking entirely in the shade, but of late there has come to pass a wonderful reaction in favor of the latter beverage; it is quite likely that this fact is considerably due to the improved method of manufacture invented by Mr. C. J. Van Houten and employed by his successors, Van Houten & Zoon, who are by far the most successful manufacturers of pure, soluble powdered cocoa in the world. Van Houten's Cocoa has been introduced into almost every civilized country, and wherever it has gone it has taken the market at once and held it despite all opposition.

Unfavorable Weather in Southern Iowa.—H. I. Clark, Monroe Co., Iowa, writes us that the season for harvesting has been very unfavorable on account of too much rain and the cool weather. The oat crop has suffered most of all, and is nearly ruined. A small quantity has been threshed, but the larger part has been considerably damaged in the shocks. Pasturage is abundant and the prospects for corn are very good.

The Dairymens' National Protective Association has work ahead. It means to compel Congress to pass a law subjecting oleomargarine n "original packages" to the laws of the respective States. Without such an act State laws are largely inoperative. Dairymen should coöperate in this work by addressing the association's attorney for petitions, etc., L. S. Kauffman, 1326 Chestnut street, Philadelphia, Pa.

American Sheep in South Africa.—Mr. William M. Lendrum, Cape Colony, South Africa, writes us: The Hon. J. M. Orpen, Member of the Legislative Assembly of Cape Colony, and his son, have imported four Vermont Merino rams from the United States for the purpose of improving their stock. The AMERICAN AGRICULTURIST was the means of their doing so through the illustration and description published in its columns.

Veterinary Education.—The New York College of Veterinary Surgeons was empowered by an act of the Legislature passed in 1857 to confer the degree of Veterinary Surgeon. The catalogue for the session for 1891-92 is just received. The only change in the Faculty is the Professor of Bovine Pathology and Obstetrics now filled by A. S. Heath, M. D. Over one hundred students registered last session, and the outlook for the coming year is still more encouraging.

Windmills and Barn Floor Horse Powers.—Readers desirous of a class of goods made upon honor, and by one of the old reliable firms of the country, should write Messrs. Smith & Pomeroy, of Kalamazoo, Mich., for their fine catalogue of Eureka windmills and illustrated poster before purchasing. They manufacture quite an extensive line, and let no jobs out under contract, all being done under their personal supervision and in their own manufactory. Their Barn Floor Horse Power is something every farmer needs. It is simple, cheap, and reliable.

The success of Dr. McMichael, of Chicago, in the treatment of cancer without employing the knife has elicited much favorable comment from the medical profession. Records in the cases show cures without return of the disease in eighty per cent of the cases of cancer treated by his method. This is a remarkable showing when it is contrasted with the method of removing the growth by the knife, for the reports show that ninety-seven per cent of cancerous tumors cut out return sooner or or later, and the patient eventually dies with the disease. Much credit is due to any physician who can successfully combat this disease, which has hitherto been considered incurable.

American Pork Abroad.—Germany took an average of 28,500,000 pounds of our pork annually prior to the prohibition of 1883. France bought nearly twice as much of this meat as did Germany. Denmark received over 3,000,000 pounds a year, but her restrictions reduced the amount to 855,000 pounds last year. If France joins these two countries in admitting American pork at the former terms it would amount to a new market for close upon eighty million pounds of pork products, which is equal to eleven and one-half per cent of our current total annual export of 690,000,000 pounds. It is to be remembered, however, that in competing for these markets we must encounter the opposition that will naturally come from the sources that have been supplying these countries during the exclusion of our products.

The San Francisco Market, as practically establishing agricultural values on the Pacific coast, is of much comparative importance. Its top quotations September 14 were as follows: Butter, 35 cents; cheese, 10½; eggs, 37½; chickens, $7 per dozen; turkeys, $19; geese, $1.75 per pair; ducks, $6 per dozen; calves, 8½ cents per pound alive; lambs, 10; sheep, 8½; hogs, 8; beef cattle, 6; wheat and oat hay, $13.50 per ton; alfalfa, $11.50; straw, 50 cents per bale; bran, $21 per ton; shorts, $24.50; ground barley, $24; potatoes, $1 per cental; onions, 50 cents per cental; cabbage, 50; beets, $1; turnips, 75; pea beans, $3; wheat, $1.62½ per cental; barley, $1.12½ for new brewing, and $1.06 for feed; corn, $1.50; oats, $1.40; rye, $1.62½; hops, 18 cents per pound; wool, 18 to 22; honey, 14; evaporated apples, 7; green apples, $1 per box; rye flour, $5.50 per barrel, and extra family flour $5.25.

Ensilage Machinery.—The E. W. Ross Co., Springfield, O., are offering to the trade for the season of '91 and '92 two new and distinct lines of fodder and ensilage cutters, new lines of elevating carriers, railroad or tread powers, from new designs and from new patterns; also triple geared sweep powers, and claim distinct advantages for their manufactures. The company have made this business a specialty for a good many years and are in the front in the matter of improvements; by reason of their large experience they are well qualified to offer to the trade the best goods, combining latest improvements, whether in connection with putting up ensilage or in cutting dry fodder. This company have for many years made a very thorough study of the subject of ensilage and cutting of fodder, and their publications on these subjects combine the opinions of prominent stock breeders and experts in the United States. They will furnish free copies of their Standard Work on Ensilage and Silos, and also a copy of their new Illustrated Catalogue to any one sufficiently interested in the subject to write for the same.

A Big Disappointment.—The exclusive rights of the United States in the Cuban markets under the new reciprocity treaty with Spain, were secured by the denunciation by Spain of all treaties in conflict therewith. Those exclusive rights go into effect upon the expiration of Spain's treaty with Great Britain (and as our reciprocity treaty with Spain of August, 1891, provides) on the 1st of July, 1892. This is the official statement made by the United States Department of State to the AMERICAN AGRICULTURIST under date of September 11. Until that time, July 1, 1892, therefore, Canadian and other British produce may enter the Spanish West Indies on the same terms as produce from the United States. This will be a great outlet for Canadian potatoes, but after July 1, 1892, United States tubers will have free admission, while the Canadian potatoes will be excluded by a tariff equivalent to twenty-eight cents per bushel of sixty pounds. The acting Secretary of State, W. F. Wharton, further writes of the schedule which went into effect September 1: "The transitory schedule was chosen with the contingency in view which is now reported to have arisen—no other arrangement being possible at the time by reason of the treaty obligations of Spain with the powers. That schedue was designed promptly to secure to the United States privileges not heretofore enjoyed by them or by any other nation; but negotiations could not, in the judgment of Spain, exclude, without violation of her existing treaty obligations, any other nation whose commercial reciprocity treaty with Spain included the most favored nation clause."

A Book for Stock-Raisers.—Costs but two cents This neat little booklet of sixty-four pages on "Hogology" should be in the hands of all swine-breeders. It contains facts that have taken years to discover. Swine disease, its cause, symptoms, contributary practices, etc., should be read by every agriculturist in the land. How to prevent and arrest disease is also shown, and the success of treatment demonstrated by the experience of some of the most extensive stock-raisers in the country. An excellent article upon breeding, in which are shown the ill effects of inbreeding and close breeding, will lead to the improvement of herds which deteriorated through neglect. The chapter on what will prevent the sows eating their pigs will be helpful to many who have lost pigs in that way. The comparative value of foods as flesh and fat formers is a guide by which every feeder can form a plan of profitable feeding. Supplementary to this are articles on "ground feed," "cob-meal," and clover for hogs. The chapter on the subject of ignorant prescriptions is timely, showing the danger of using carbolic acid, copperas, antimony, etc., which many farmers now feed in hurtful quantities. Much of the loss assigned to "hog cholera" is due to the administration of these hurtful drugs and to the use of vile compounds sold by charlatans as swine remedies. Finally, a detailed description and history of various breeds of swine, standard of excellence of pedigreed stock, Swine Record Associations, etc., are given. There will be a great demand for this booklet, and those who wish a copy should apply now. Send a two-cent stamp and your full address to Joseph Haas, Y. S., Indianapolis, Ind.

The New York State Fair.—As we go to press the New York State Fair is in progress at its new and permanent fair grounds near Syracuse, a description of which has been given in the last January number of the AMERICAN AGRICULTURIST. The convenience and suitability of the various buildings for the purposes for which they were designed, have been fully demonstrated in every instance. Notwithstanding that the number of entries in nearly all departments far exceeded all reasonable expectations, everything was quickly and conveniently accommodated. The novel arrangement of the buildings for the various classes of live-stock was found particularly convenient for the visitors, as well as comfortable for the animals, and may well serve as a model for other fair grounds. A permanent horticultural building having not been erected as yet, the horticultural products had to be accommodated in tents. One very large tent was filled with vegetables; cut-flowers, plants and floral designs required two tents; and the display of fruits overflowed its originally designated limits to such an extent that three very large tents had to be erected for its accommodation. Actual measurement of the entire surface covered with fruits showed that if all the fruit on exhibition had been arranged on a single table, four plates across in the usual manner, it would have required a table of nearly, if not quite, half a mile in length. More remarkable, however, than the building quantity and variety of fruit was the uniform excellence and perfection of the exhibits, and the accuracy with which the varieties were named. Taken all in all, it is safe to assert that a better and larger exhibition of fruits has never been seen before in the Eastern and Middle States.

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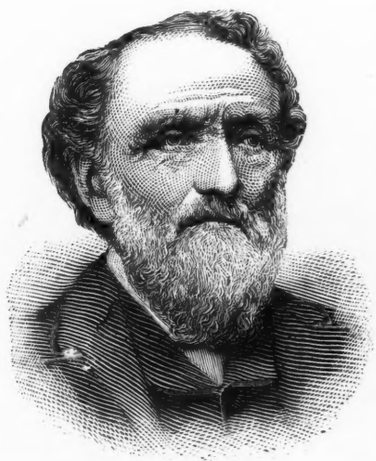

Joseph Addison Hallock (Octogenarian)

THE WINTER OF 1834-35 was my first experience with rheumatism. I was traveling as a Home Missionary, and with great difficulty and suffering I reached my appointments. It was located in my hips and back. From that time to this year of grace, 1891, I have suffered more or less under the grip of that disease. About three years later, liver complaint, and the calomel taken to cure it, fastened upon the walls and organs of my chest a rheumatic affection from which I was never wholly free, and at times even a full breath was a cruelty. Yet, in a general way, my health has been as good, perhaps better than the average of men.

During the last days of the late year, I bought of Dr. Owen two of the Owen Electric Belts. One I have worn, the other a daughter has worn. In either case the remedial has been satisfactory. The rheumatism of my chest and hips I can no longer find. A limited case of varicocele, of more than thirty years standing, after two weeks' use of the Belt, had diminished to a mere lump, and a few days later could not be found. A nasal catarrh of years had so affected the substance of the nose that a friend in jest twitted me of brandy. My nose is itself again, and other symptoms of nasal and throat catarrh are fast disappearing, carrying my deafness of seven years with them.

I have studied electricity in its bearings upon mental and physico mental phenomena for fifty years, and have seen its wonders in these directions, and thus prepared my attention was easily turned to its efficiency in controlling the nerves, muscles and motions of the living, as galvanism does those of the recent dead.

I have no wish to undervalue any appliance which carries a real electric current from a genuine battery to human nerves with a gentle, a genial force; but I do wish to do my utmost to disarm public fears as to the well ordered Electric Belts.

JOS. ADDISON HALLOCK,
Cummings P. O., Chicago, Ill.
January 30th (Octogenarian).

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THE LARGEST ELECTRIC BELT ESTABLISHMENT IN THE WORLD.

New Markets for Fruits and Vegetables.

(*Continued from Page 578*).

The Northern firm, when asked to rectify the mistake, affirmed that the trade was too small to warrant so much fussiness over the tins. The goods were liked in Brazil, and there was an increasing market for them, but the American lack of adaptability in dealing with the requirements of the climate and the trade prevented their general introduction.

In hot countries coffee is taken early in the morning with bread, and breakfast is served at noon. Soup, fish, two or three ragouts of meat and garlic, a steak or chop, a salad and sweetmeats make the ordinary breakfast of a family in comfortable circumstances. Dinner follows at seven with repetitions of most of these courses, a roast being substituted for the broiled steak or chop and a dab of preserves answering for dessert. Pastry and fruit are not eaten at either meal, but sweetmeats are served at each. Salads take the place of vegetables, and olive oil is freely used for dressing them. Sauces and relishes of all kinds are liked and are used with every course.

This being the diet of the better class of Spanish-Americans, the importance of some of the concessions made in the reciprocity treaties is apparent. Not only are preserved fruits on the free lists of three of the treaties, but cottonseed oil, which is a cheap substitute for olive oil, is also included. By the Spanish treaty pastes for soups, sauces, pickles, jams and jellies are admitted at a reduction of fifty per cent. Rice is one of the commonest articles of diet in Cuba, being used as a substitute for potatoes. A reduction of fifty per cent in the duties on rice will increase largely its importation from the United States.

By the Brazilian treaty potatoes, on which a duty of fifteen per cent has been paid, are put on the free list; the tax of twenty per cent on beans and peas is removed, and canned vegetables, to which forty-eight per cent has been added by the tariff, are admitted with a reduction of twenty-five per cent. These concessions ought to prove important gains for exporters of garden produce, and for the farmers as well. Potatoes do not thrive in any Southern country, and are invariably of inferior quality.

Brazil has imported over $1,000,000 of potatoes from other countries, but hardly a dozen barrels a year from the United States. Of beans and peas, it has imported $1,039,522 from other countries, and only $478 from the American market. Of canned goods, it has taken only $13,894 a year from that market, including meats, fish and vegetables, and $606,197 from other markets. The reductions in the tariff duties will have the effect of largely increasing the demand for fresh and canned vegetables from the United States.

By the provisions of the Spanish treaty, vegetables and garden products are admitted to a free market in Cuba, under the transitory schedule after September 1, 1891, and under the the permanent schedules after July 1, 1892. The duties have been high and have been levied in the interest of Spanish farm products. Under a liberal construction of the terms of the agreement the exports of potatoes, beans, peas and canned vegetables will be doubled from the American market. The San Domingo convention places all vegetables, fresh, dried or canned, upon the free list and thereby enlarges the export trade in farm and garden products.

In addition to the breadstuffs mentioned in a previous article (see the AMERICAN AGRICULTURIST for September) hay, oats and barley are admitted by treaty to a free market in Brazil, involving reductions of twenty and fifteen per cent. No barley has been imported from the United States, and only $500 a year in oats and hay, while about $1,000,000 of this class of produce has been taken from Argentina. These field products, with bran and straw for forage, are on the free list of the Spanish treaty.

In both farm and garden produce, and especially in flour, potatoes, beans, peas and hay, to say nothing of lumber and fish, this convention will operate disadvantageously for Canadian exporters. The discriminations against their own and in favor of American products may be removed by a reciprocity convention to be substituted in the future for the British treaty which will expire next July. It may be practicable for England to secure for Canada the negotiation of such a treaty, by which the advantages derived by the United States in its Cuban trade will be shared. It is already officially stated that these advantages will be shared by Canadian produce up to July 1, 1892, under the existing British treaty.

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Family Medicine

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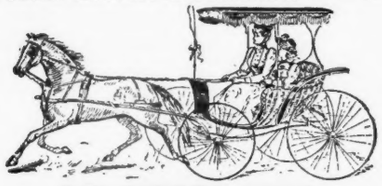

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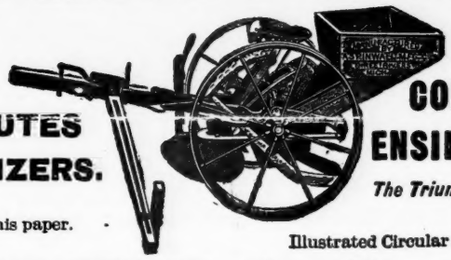

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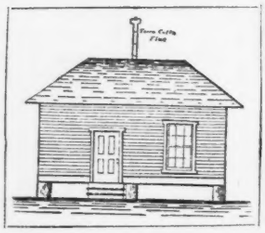

B SURE TO READ This Offer

This cut shows the **front elevation** of the two-room frame cottage we construct for actual settlers on our land. It is weather boarded outside and ceiled inside with yellow pine, has a floor of dressed tongue and groove flooring, shingle roof, panel doors and good sash in window openings. Terra Cotta flue with openings for stove in each room. We furnish the above cottage, eighty (80) acres of good upland, and fence twenty (20) acres for Five Hundred ($500) Dollars. **Land to be within two miles or less of the line of the Mobile & Ohio Railroad,** and will produce cotton, corn, tobacco, sugar-cane, upland rice, Irish and sweet potatoes, oats, rye, barley, millet, broom-corn, strawberries, grapes, peaches, pears and all varieties of garden and orchard products suitable to the climate. **Pure freestone water and unsurpassed healthfulness of location guaranteed.** Terms: Half cash, balance in twelve months, with interest at the rate of 6 per cent per annum. Write for further information. **If you want a country farm and home, you cannot afford to neglect this offer.** Address **ALABAMA LAND AND DEVELOPMENT COMPANY, Mobile, Ala.,** or J. N. EBERLE, L. & I. Agent, No. 1105, Poplar Street, St. Louis, Missouri.

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WHERE last year farmers netted $100 to $200 per acre for fruit grown on land that can be duplicated to-day for $30 per acre.

WHERE five tons of alfalfa hay, worth $12 per ton, was grown on land the like of which can be bought for $15 per acre.

WHERE many other products, such as sweet potatoes, tomatoes and early vegetables netted as large and larger profits than fruit.

WHERE the summers are cool, the winters warm, cyclones unknown and malaria unheard of.

WHERE there is the best opening in the world for honest industry.

To W. F. WHITE,
Passenger Traffic Manager, A., T. & S. F. R. R.
Or, HENRY F. GRIERSON,
Immigration Agent, A., T. & S. F. R. R.,
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This railway passes through twelve States and territories, and having no lands of its own to sell has no object in advancing the interests of any special locality, or in giving any other than absolutely reliable information. It realizes that the prosperity of the farmers of the great Southwest means prosperity to itself also, and is thus naturally willing to aid the immigrant as much as possible.

FOR SALE.

A SPLENDID FARM

In Hunterdon County, New Jersey.

146 acres, all tillable; house 1-4 mile from village, church, school, store and mill; 2 1-2 miles from good market, prosperous town of 4,500 population, on the Pa. R. R., 75 minutes to Philadelphia; 2 hours to New York; direct trains. Good buildings in excellent repair. Frame house, 11 rooms, in excellent condition, well shaded with sugar maples, cistern and spring of excellent water at the door. 20 acres of rich meadow well shaded, with large stream running through it. Natural sweet grass, affording abundant pasture from early spring till late fall. Large mill-pond, 1,500 tons ice capacity. 3,200 peach trees, choice varieties, one and two years old. 75 apple and 30 pear trees in bearing. High cultivation; good fences; convenient fields; well watered. A good tenant house. Address or apply to

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TRUSTEE'S SALE. The celebrated **"Southern View Farm"** of Col. Jas. M. Byars in Washington Co. Va., will be sold at public auction October 15th, 1891. 1500 acres (500 River Bottom) Limestone, Blue Grass land, highly improved, very productive and very beautiful. Part of Blue Grass sod not broken in 50 years. Residence and grounds improved and attractive, magnificent scenery. Railroad, telegraph and telephone facilities. Surrounded by schools and colleges and as good society as Virginia affords. Barns for 300 cattle. **No such property ever before offered publicly in this region.** Apply for particulars to
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Timber lands and granite quarries. Mild Climate. Good markets. Catalogue free. Correspondence solicited. **THE VIRGINIA IMMIGRATION LAND AND IMPROVEMENT COMPANY,**
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THOMAS WHITEHEAD,
Commissioner Agriculture and Immigration,
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East Louisiana Land and Investment Co., Limited, Clinton, Louisiana.

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Land Good! Prices Cheap! Taxes Low!
Farms and City property for sale. Write to
WOODS & AYLETT,
or Mayor of City, Charlottesville, Va.

FOR SALE—A fine farm five miles from Richmond, Va., containing 166 acres; fine orchard and vineyard; well fenced, well watered, new dwelling of 9 rooms, wine cellar and all necessary outbuildings. Excellent granite underlies a part of the land. Price reasonable and terms easy.
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THE MOST PERFECT OF PENS.

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1000 BICYCLES to be GIVEN AWAY FREE TO BOYS AND GIRLS UNDER 18 YEARS OF AGE. Not sold but given away without a cent of cost. FOR ADVERTISING PURPOSES.

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1000 or more elegant safety bicycles to boys and girls under 18 years of age, on easy conditions and without one cent of cost for them.

The wheels are 25 inches, with crescent steel rims and molded rubber tires, and run on hardened steel cone bearings, adjustable to wear; geared to 46 inches; detachable cranks; four to five inches throw; frame finely enameled, with nickel trimmings. Each machine is supplied with tool bag, wrench and oiler. Equal in quality to those sold on the market for $45.00. We have both boys' and girls' styles.

If you want one without spending a cent of money for it write at once for particulars and names of hundreds of boys and girls to whom we have already given bicycles. Address

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Arouse the faculties, stimulate the circulation, purify the blood, with Ayer's Sarsaparilla.

WANTED—Lady or gent in each place can make $3 a day sending out circulars on our new plan. Send stamp for sample and terms to
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Lectures will begin October 1st, 1891. This was the first School of Comparative Medicine and Surgery established in the United States. For circular, address
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Beats Cleaning a Muddy Tail.
All Polished Metal.
Sample 25c. DES MOINES NOVELTY CO.,
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AGENTS send for **How I Made a House and Lot in One year.** Our copyrighted methods free to all desiring a Home, or business chance. $75 to $100 Monthly. Teachers and Ladies find big pay for spare hours. TREASURY PURCHASING AGENCY, 27 4th Ave., New York.

ESTABLISHED JAN. 1st, 1866. PATENT WATER PROOFED

CHEAP STRONG WATER PROOF, Applied by our new **Patent method** with ⅓ the labor of any other way. Unlike any other roof. **No rust or rattle.** An **Economical** and **DURABLE SUBSTITUTE** for **PLASTER** on walls. **Ornamental CARPETS** and **RUGS** of same material, **cheaper** and **better** than Oil Cloths. Descriptive catalogue and **Samples Free.**
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EVERY HOUSEKEEPER NEEDS THE PERFECTION

A HOUSEHOLD NECESSITY.

NO HOME COMPLETE WITHOUT IT. SIMPLE TO USE. NEVER WEARS OUT. Made of tin. Most useful, convenient and only perfect article of its kind ever invented. Combines sack or barrel, sifter, pan and scoop. **WILL PAY FOR ITSELF** in a short time by saving waste, time and labor. Keeps out dust, vermin, etc. Preserves flour from mould and mustiness. Enough for baking sifted in one minute. It pleases everybody. Satisfaction guaranteed. Sent by express on receipt of price. To hold 25 lbs., $2.50, 50 lbs., $3.00, 100 lbs., $4.00. **AGENTS WANTED. WRITE FOR CIRCULARS.**
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26 & 28 W. LAKE St., B. 41, Chicago.

WOOD ASHES for sale in car load lots at 15c per bushel on cars, at Torrington, Ct.
A. P. HINE.

HAY FEVER For the cause (not cure), which is preventable. Sufferers only address **THEODORE RUE,**
BOX 199, Beverly, N. J.

SEATTLE the Metropolis of **WASHINGTON.** Send stamp for "Travels of Brother Jonathan" to **Eshelman, Llewellyn & Co., Seattle, Wash.**

HORSE POWERS,

THRESHING MACHINES, and WOOD-SAWING MACHINES

BEST IN THE MARKET.

LIVINGSTON, MONT., Dec. 1, 1890.

Messrs. A. W. Gray's Sons—Gentlemen:—The two-horse Power and Wood Sawing Machine I bought of you came all right. I have tried it both on cord wood and on long pole wood, and, gentlemen, I am proud of it. *It is a hummer.* I have worked the old style of Threshing Machines, but have no more use for them. It will cut cord wood as fast as I can put it to the saw. Very truly yours, M. J. McGINNIS.

J. M. GILBERT, of Cornton, Vt., writes: "I threshed with one of your two-horse machines 4,000 bushels of oats in two weeks, 2,100 bushels in one week, and 500 bushels in one day.

All who are interested in **Horse Powers, Wood Saws or Threshing Machines,** are invited to write for 50 page pamphlet, **Free.** Address

A. W. GRAY'S SONS
Patentees and Sole Manufacturers,
P.O. Box 8. MIDDLETOWN SPRINGS, VT.

The American Agriculturist Art Contest.

THE CLASSIFICATION AND RULES GOVERNING THE AWARD OF THE $500 OFFERED.

This competition was announced in our September issue (Page 516). It is divided into four classes, the prizes in each class being $50, $25, $15, and $10, besides which $100 will be given for especially meritorious work that may not secure a prize in these classes. Drawings that are designed to make a full page engraving should not exceed fifteen inches in width by sixteen and one-fourth inches high, which allows for reduction in engraving. For a five-inch picture when reduced the drawing should be ten inches wide; for a four-inch picture make the drawing eight inches in width, with similar proportions for smaller. The height in these latter cases need not be arbitrary so long as the drawings are in fair proportion. Drawings must be executed in jet black India ink. The sketches are to be carefully packed and sent by mail or express prepaid to "Art Contest AMERICAN AGRICULTURIST, 52-54 Lafayette Place, New York." The artist's nom-de-plume should appear in pencil on the upper left-hand corner of each sketch; also of any accompanying manuscript, the whole to be sent flat. The same person may compete in more than one class. More than one specimen of work may be entered in any class by the same person.

Class One.

ANIMAL LIFE.—Portraitures of typical animals of the various breeds of cattle, horses, sheep, swine, poultry, pigeons, dogs, etc. Merit in this class will necessitate accurate and life-like execution and naturalness of posture. This does not mean "fancy pictures," that are practically useless to farmers and stockmen, but correct portraits of a known animal, or bird, executed with a faithfulness that shall make the drawing replete with life. The subject should be some animal whose breeding, pedigree and record render it worthy of discussion and illustration in the AMERICAN AGRICULTURIST.

Class Two.

HUMOR AND WIT.—This class includes cartoons on current affairs affecting agriculture, issues of the day as they relate to farmers, hits on prominent agricultural officials, take-offs on agricultural fads and peculiarities, etc. In this line artists must bear in mind the dignity of agriculture, and avoid making the farmer or his business the butt of ridicule. This class is also open to all kinds of witty pictures, amusing scenes in natural life, on the farm or in the home, and anything that may properly provoke a smile in young or old.

Class Three.

DOMESTIC AND LITERARY AFFAIRS. — The sketches may pertain to household economy, interior and exterior home decoration, new ideas for making home life more attractive, rural society more interesting, etc. This class will include work-saving conveniences used in the household, in window-gardening, outdoor flower-culture, dress-making, etc.; ingenious devices to aid in the care and entertainment of little children; diagrams and illustrations of novel games and indoor and outdoor amusements; sketches of decorations for schoolhouses, society halls, platforms and playrooms; suggestive ideas for holiday occasions, etc. Originality is a chief requisite for this class. No photograph cases, broom-holders, sachet-bags, match-safes or sofa-pillows are wanted, and no decorative ideas will be considered unless they possess some point of novelty. Pen drawings may illustrate accompanying literary manuscripts, the latter to be paid for at our regular rates if accepted.

Class Four.

RURAL AFFAIRS. — This may include drawings illustrative of improved methods, plant life, natural history, village improvement, country scenes, and other matters pertaining to Nature and to outdoor work and life not specially included in the foregoing classes. A sketch or group of drawings illustrating the different phases of farm life and work may be of general interest. In this connection outdoor sports for men and boys might be illustrated in a series of sketches showing how conducted, funny incidents that occur in such sports, and the like.

Drawings must reach this office not later than December 1, 1891, except that sketches from subscribers in foreign lands that may be late by reason of the distance will not be debarred.

SEXTONVILLE, WIS., June 10th, 1891.
Gentlemen:
We ordered a No. 25 Double Harness of you last fall which gave perfect satisfaction. Will you send us another equally as good stock. We have a chance to dispose of ours, but would not like to do so unless we can get a duplicate in quality.
Yours respectfully,
DEVOE & SON.

Prices Beware!
Goods Compare!

For 21 consecutive YEARS we have made and sold

BRENTWOOD, CAL., June 25th, 1891.
Gentlemen:
The $136.00 Surrey and No. 28 Harness arrived in due time, with everything complete and in good order, and I am well satisfied with it. All my neighbors who have seen it think it is extra good for the money, and I think you will get more orders from this part of the country. Yours truly,
ANDREW PORTMAN.

BARKLEY $55.00 BUGGIES AND HARNESS BARKLEY $5.50

ROAD CARTS, $11.50.
GOAT CARTS, $4.00.
GOAT HARNESS, $1.50.

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BUT NOW we are selling direct to the consumers, saving you the Traveling Man's Expenses and Dealers' Profits. Write for illustrated catalogue and prices.
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That INFERIOR INFRINGING IMITATIONS of the "OLD ORIGINAL HILL" HOG RINGS and RINGERS are being palmed off on them for the GENUINE, by unscrupulous Dealers. See that our TRADE-MARK, as shown, is on each box. If you cannot get the genuine, send us $1.00 and we will mail post-paid an IMPROVED RINGER and 300 RINGS, 100 each size, Pig, Shoat and Hog. Our map Nick-names of the States FREE with each order. H.W. HILL & CO., 160 W. Main St., Decatur, Illinois.

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TREES, SHRUBS, ROSES, BULBS.

Full Line Fruit and Ornamental, Deciduous and Evergreen Trees, Grape-vines, Small-fruits, Shrubs, Roses, Winter-blooming, and Hardy-border Plants, Bulbs, Etc.

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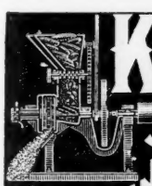
KELLY DUPLEX GRINDING MILL.



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Satisfaction Guaranteed
AWESOME ILLUSTRATED CATALOGUE SENT FREE

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(For Fall Planting.)
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Complete Catalogue FREE. | ELLWANGER & BARRY
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CHESTNUTS—JAPAN MAMMOTH and GIANT. Parry's; Japan Walnuts, JAPAN GOLDEN RUSSET, IDARO and Kieffer Pears, ELEAGNUS LONGIPES, HARDY ORANGES, and other valuable novelties. Small Fruits, GRAPES etc. Fruit Shade and Nut Trees, Ornamental Shrubs, Vines, etc. Illustrated Descriptive Catalogue Free.
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ICE PLOWS. Address H. PRAY. Circulars FREE. Clove, Dutchess Co., N. Y.

Recent Publications.

FROM THE EXPERIMENT STATIONS.

UNITED STATES DEPARTMENT OF AGRICULTURE—Division of Ornithology and Mammalogy, North America Fauna, No. 5; results of a biological reconnoissance of South-Central Idaho, descriptions of a new genus and two new species of North American mammals; Division of Statistics, Report No. 87 (new series), August, 1891; report of the condition of growing crops, freight rates of transportation companies; Office of Experiment Stations, Experiment Station Record, Vol. III, No. 1, August, 1891, Miscellaneous Bul. No. 3; Proceedings of the Fourth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations.

FLORIDA—Exp. Sta. at Lake City, Bul. No. 13, April 1, 1891, Irish potatoes, rye, and fertilizers.

GEORGIA—Exp. Sta. at Experiment, Special Bul. No. 12½, July, 1891, circular to the farmers of Georgia from the board of directors; Bul. No. 13, July, 1891, analyses of feeding stuffs, forage plants.

KANSAS—Exp. Sta. at Manhattan, third annual report, 1890.

MASSACHUSETTS—Hatch Exp. Sta. at Amherst, Bul. No. 40, July, 1891, weather record, April-June, Some diseases of lettuce, fertilizer analyses, feeding experiments with steers; Meteorological Bul. No. 31, July, 1891.

MISSOURI—Exp. Sta. at Agricultural College, Bul. No. 15, July, 1891, tests of varieties of wheat and oats, change of seed of wheat, oats, and potatoes.

NORTH CAROLINA—Exp. Sta. at Raleigh, Bul. No. 78, July 10, 1891, some injurious insects, Bul. No. 77*b*, July 1, 1891, the injury of foliage by arsenites with fungicides; Bul. No. 75*c*, April 28, 1891, meteorological summary for North Carolina, February, and March.

OHIO — Exp. Sta. at Columbus, ninth annual report.

PENNSYLVANIA—Exp. Sta. at State College, Bul. No. 16, July, 1891, culture of the chestnut for fruit; analysis of several varieties of chestnuts.

TEXAS—Exp. Sta. at College Station, Bul. No. 15, May, 1891, influence of climate on composition of corn, digestibility of food stuffs, miscellaneous analyses; Bul. No. 16, June, 1891, work in horticulture, drainage experiments.

UTAH—Exp. Sta. at Logan, Bul. No. 7, July, 1891, draft of mowing machines.

VIRGINIA—Exp. Sta. at Blacksburg, Bul. No. 10, June, 1891, steer- and pig-feeding.

WYOMING — Exp. Sta. at Laramie, Bul. No. 2, August, 1891, plant lice.

FROM THE TRADE.

P. J. BERCKMANS, Augusta, Georgia: Illustrated and descriptive catalogue of fruit and ornamental trees, grapevines, small fruits, roses, flowering shrubs, bedding, and greenhouse plants, etc. These are selected with a special view to their adaptation to the Southern States. This is the best equipped nursery establishment in the Southeast, and in management is not excelled by any similar establishment elsewhere.

JOHN LEWIS CHILDS, Floral Park, N. Y.: Illustrated and descriptive catalogue of bulbs and plants for fall planting. This is a gorgeously gotten-up pamphlet, with a handsomely-colored cover and a great number of other illustrations representing the leading kinds of plants offered.

P. K. DEDERICK & Co., Albany, N. Y.: Special circular and illustrated catalogue of Dederick's Perpetual or Continuous Baling Presses. The principle upon which these presses are based was invented by Mr. Dederick. Although these machines were the first successful horizontal presses introduced they have been so variously and intelligently improved upon that they rank to-day second to none anywhere.

V. H. HALLOCK & SON, Queens, N. Y.: Wholesale catalogue of forcing bulbs, comprising Dutch bulbs, lilies, gladiolus, etc.

JOHNSON & STOKES, Philadelphia, Penn. Illustrated and descriptive catalogue of specialties for fall planting; wheat, grass, and garden seed. Also bulbs and other plants for spring blooming.

JAMES MORRISON, Tarrytown, N. Y.: Price-list of the leading kinds of pheasants.

LEWIS ROESCH, Fredonia, N. Y.: Trade list of grapevines, small-fruit plants, etc., for fall planting.

SAMUEL WILSON, Mechanicsville, Pa.: Illustrated and descriptive catalogues of bulbs for winter and spring blooming. Also catalogue of seed wheat, small-fruit plants, poultry, and other livestock.

GEORGE S. JOSSELYN, Fredonia, N. Y.: Descriptive catalogue of grapevines, strawberries, raspberries, currants, blackberries and other small fruits. This is the original headquarters of the Fay Prolific currant and also the Red Jacket currant.

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MAKE HENS LAY
LIKE SHERIDAN'S
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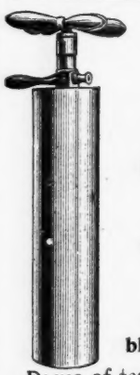

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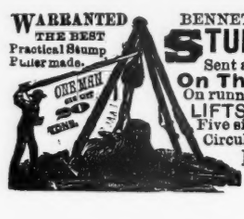

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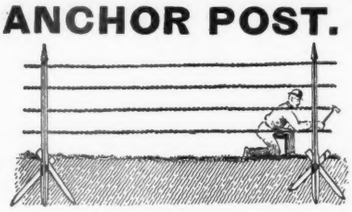

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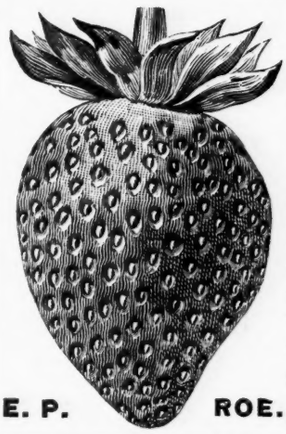

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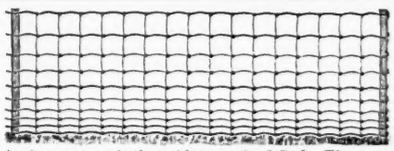

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New Fruit Fields.

A schooner is now voyaging among the West India islands, collecting valuable plants and seeds for the botanic gardens, agricultural experiment stations and nurseries which are to be established, almost immediately on the Perry land purchase in the republic of Honduras. These establishments, having the encouragement of the national government of that country, are to be owned and managed by Wm. R. King, of the U. S. Department of Agriculture, member of the American Association for the Advancement of Science, and of other scientific bodies, and by Mr. R. D. Hoyt of the American Exotic nurseries, of Seven Oaks, Florida.

These enterprises are to be established in the newly created department or state of Mosquitia, in the northeastern corner of the republic of Honduras, and will be about 920 miles from New Orleans, Mobile and Pensacola, and 1,800 miles from New York by sea. Steamers make the voyage in three days from the Gulf ports named to the Rio Patuca, which will be the port of entry of Mosquitia. Several steamship lines run vessels of good class to the Honduras Coast, whence millions of cocoanuts, pineapples and bananas are brought to the United States each year. These fruits form the most important sources of revenue Hondurans have.

The republic is little known by Americans, and they know less of the profits to be obtained from the growing of the fruits common to Honduras. Unquestioned authorities declare that an area that will grow 33 pounds of wheat will yield 90 pounds of potatoes, while the same area of bananas will produce 4,000 pounds of food, or 133 of bananas to one of wheat.

The average cost of preparing an acre of land for bananas is about $15; cultivation and harvesting can be done for $7, price of land $10, clearing and planting $15, and interest may be put at ten per cent per annum, say $2.50, making a total of $34.50 per acre. On each acre 225 plants will be set. Within twelve months after planting these should yield fully 200 bunches, worth an average of 50 cents per bunch. Deducting the price of the land, and all expenses, including ten per cent interest, there will be $65.50 net profit per acre the first year. The second year will yield at least two crops of 200 bunches each, worth $200. They will cost $7 for cultivation and harvesting, or with interest $9.50 per acre, leaving $190.50 profit.

Cocoanuts begin bearing when five years old. Fifty-five trees may be grown per acre, at a cost of $2 for nuts and planting, and $5 for keeping clean. If the price of the land, $25, be added the total will be $32. When five years old they can be rented for $55 per acre per annum. The first year's rental will pay for the land and all expenses, and leave $23 profit. Each year thereafter will bring its rental of $55 per acre clear. If the owner prefers to manage his own plantation he can get from $125 to $412 per year from each acre.

The mango (*mangifera Indica*) is unknown by the general public of the United States and Europe. When five years old it may be expected to produce from 500 to 600 fruits, and trees ten or twelve years old sometimes yield 4,000 or more, weighing more than a ton. The common kinds sell for two to three cents each, while choice varieties bring seven to ten cents apiece. A dozen good trees on an acre will thus produce $1,450 to $4,800 per annum.

Olive trees will give an income of $175 per acre when six years old, $350 when ten years, $785 when fifteen years, and over $1,200 at twenty years of age. Vanilla will give the planter $250 per acre per year; tamarinds $100 to $150 per acre; nutmegs $575 per acre; and cloves from $335 to $1,350 per acre.

Orange culture in Honduras promises to become one of the most profitable of industries. Climate, soil and other conditions are most favorable, and even the seedlings are declared by good judges to be fully equal to the improved fruit of California. The crop comes in at a time when the markets in the States are bare of domestic oranges, the distance to be covered in reaching market is less than that from the fruit lands of the Pacific States, the cost of placing the fruit in the cities of northern States is less than that of bringing oranges from California, and there need be no transportation by railroad. There is no need of irrigating the lands of the Perry grant. The income from oranges should be $200 to $400 a year per acre. Lemons should yield an income of $400 to $600 per acre.

Avocado pears (*persea gratissima*) sell readily at 75 cents to $1 a dozen in the markets of the United States. A tree at five years is expected to yield ten dozen, and fully grown trees 40 to 50 dozen worth $10 to $50. An acre having sixty-four trees will at these rates give an income of $320 to $1,600 per year.

The cacao (*Theobroma cacao*) called cocoa or chocolate by English speaking peoples, grown in Honduras has long been held in high favor by dealers. For centuries before the Spanish invasion of Central America, cacao seeds were used as currency by the inhabitants of those countries as it is to-day in some isolated parts of the interior. The trees, set among the banana plants, begin bearing when four years old, and produce about 160 pounds per acre; at eight years 600 pounds, which at 20 cents to 37 1-2 cents per pound will give $120 to $225 per acre. Pineapples are one of the most valuable resources of Honduras. An acre will yield 7,500 fruits eighteen months after planting and a like number each year thereafter. They will sell for $300 to $400.

The Perry land purchase has a coast line of 100 miles on the Caribbean sea, and is sixty miles from north to south. It contains more than a million acres of the best fruit, agricultural and timber land in Central America. Four large and several small rivers flow across the tract, to empty into the system of salt water lakes or sounds that extend almost across the northern part of the grant and make four good harbors. No spot on the whole grant is more than fifteen miles from navigable water, over which steamboats can carry the products of the land to steamships that will deliver them in ports of the United States and Europe.

There is a strong and growing disposition among the more enterprising Americans to buy land in Honduras and start plantations there. Already hundreds of such purchases have been made by lawyers, doctors, clergymen, merchants, clerks and other business men, and by farmers, stockmen, mechanics and others in all parts of the United States. Many of these people are preparing to go to the Perry lands to make selections for themselves and their friends; others are going to spend the winter, and others to establish homes. The climate is unsurpassed for healthfulness and for even and mild temperature. ***

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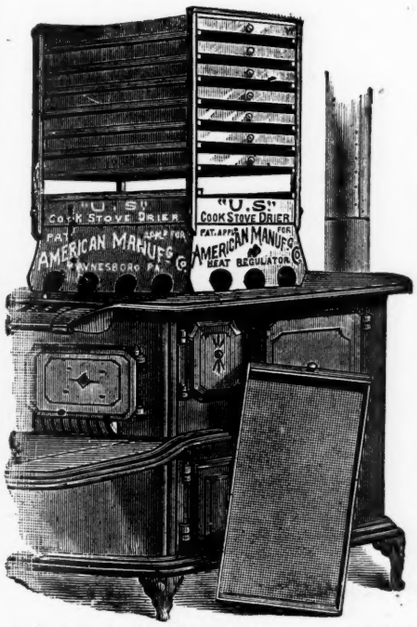

This shows the Drier set on an ordinary Cook-Stove.

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